Cassette car radio 90DC777/02/32

Service
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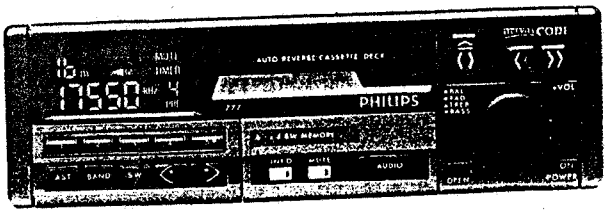

For repair information of the cassette deck see Service Manual of "Car cassette deck P6-16".

Service Manual

12 V

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Subject to modification

GB 4822 725 22626

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PHILIPS

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1.1 TECHNICAL SPECIFICATIONS

General

Power supply	: + 14.4 VDC
Fuse	: 7.5 AT
Dimensions (wxhxd)	: 180x51x152 mm

Radio

LW – wave range	: 144 – 288 kHz
MW – wave range	: 531 – 1611 kHz
FM – wave range	: 87.5 – 108 MHz
SW – wave range	: 3170 – 21910 kHz (11 meter bands)

90m	3200 – 3400 kHz
75m	3950 – 4000 kHz
60m	4750 – 5060 kHz
49m	5950 – 6200 kHz
41m	7100 – 7300 kHz
31m	9500 – 9900 kHz
25m	11650 – 12050 kHz
21m	13600 – 13800 kHz
19m	15100 – 15600 kHz
16m	17550 – 17900 kHz
13m	21450 – 21850 kHz

LW tuning grid	: 1 kHz
MW tuning grid	: 1 kHz (manual tuning) 9 kHz (search tuning)
FM tuning grid	: 50 kHz
SW tuning grid	: 1 kHz
IF–AM	: 10.7 MHz
IF–FM	: 10.7 MHz
IF–SW	: 450 kHz
Sensitivity for 26 dB S/N	: ≤ 230 µV (LW) ≤ 150 µV (MW) ≤ 6 µV (FM) ≤ 110 µV (SW at 7100 kHz)
Limiting point α – 3 dB	: 15 µV ± 5 µV
10 dB crosstalk	: 150 µV ± 50 µV

Cassette player P6–16

Number of tracks	: 2 x 2
Tape speed	: 4.76 cm/sec.
Wow and Flutter	: ≤ 0.3 %
Crosstalk	: ≥ 30 dB

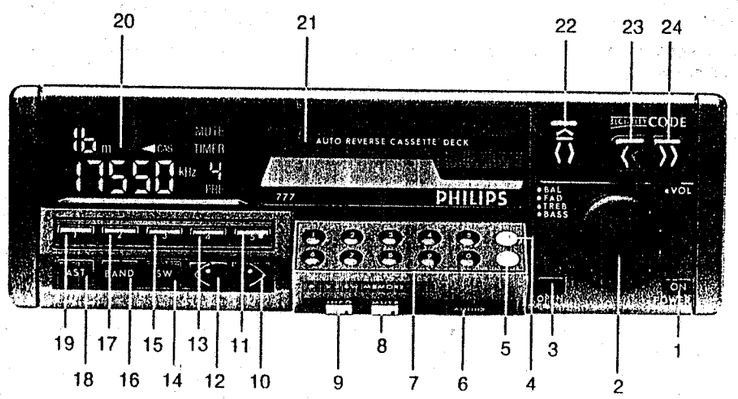
Amplifier

Output power (D≤10%)	: 2 x 17W ± 1 dB/4Ω : 4 x 5.5W ± 1 dB/4Ω
Line out	: 630 mV
Bass	: +/- 12 dB at 100 Hz
Treble	: +/- 12 dB at 10 kHz
Loudness	: + 8 dB at 125 Hz : + 2 dB at 1 kHz : + 5 dB at 10 kHz

1.2 ACCESSORIES

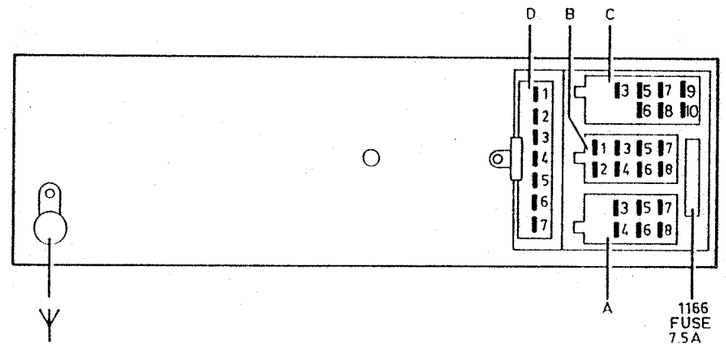
Retractable unit*	: 22EA6027
Line out cable*	: 22EA6164
Instructions for use	: 4822 736 20547
Shortwave booklet	: 4822 736 20546
Remote control*	: 4822 218 10229
Cable for remote control*	: 4822 321 22878

* not included with the set.



2.1 EXPLANATION OF CONTROLS

1 Power on/off
2 Volume + audio modes control
3 Door open button
4 Frequency/Time select
5 Enter key
6 Audio mode select
7 Keyboard 0-9
8 Mute
9 Info
10 Search, manual-up tuning
11 Preset 5, SW preset level select
12 Search, manual-down tuning
13 Preset 4
14 Shortwave band select
15 Preset 3, Timer 3
16 LW-MW-FM band select
17 Preset 2, Timer 2
18 Autostore
19 Preset 1, Timer 1
20 LC-Display
21 Tape deck compartment P6-16
22 Reverse, eject
23 FRW/FFW
24 FFW/FRW



2.2 EXPLANATION OF CONNECTIONS

A3: Remote on/off (active L.S)
A4: + 14.4V permanent
A5: Automatic aerial
A6: Ext. illumination
A7: + 14.4V switched
A8: Supply ground

B1: Speaker Right Rear
B2: 7 W – 4Ω
B3: Speaker Right Front
B4: 7 W – 4Ω
B3: Speaker Right
B2: 20 W – 4Ω
B5: Speaker Left Front
B6: 7 W – 4Ω
B7: Speaker Left Rear
B8: 7 W – 4Ω
B5: Speaker Left
B8: 20 W – 4Ω

C3–C10 : Remote control socket

D1–D7 : Line out socket
D1 : Remote on/off (booster)
D2 : Fader enable
D3 : Signal ground
D4 : Signal Right Front
D5 : Signal Right Rear
D6 : Signal Left Front
D7 : Signal Left Rear

3.1 ESD

All IC's and many other semi-conductors are susceptible to electrostatic discharges (ESD).
Careless handling during repair can reduce life drastically. When repairing, make sure that you are connected to the same potential as the mass of the set via a wrist wrap with resistance. Keep components and tools also at this potential.

3.2 SERVICE TEST PROGRAMME

The test can be called without first entering the Security Code.

Display test

The display test is called by switching on the set **while** keeping the keys **P1 and P4** depressed. All the segments are turned on and the display remains static (see fig.1). The test is stopped by switching off the set.

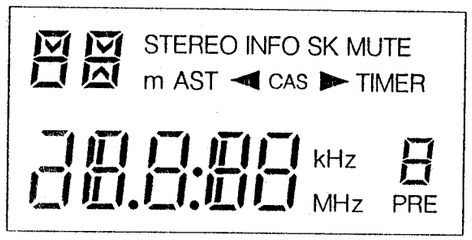


Fig. 1

3.3 INSTRUCTIONS FOR USE

SECURITY CODE

Introduction

To reduce the risk of theft, the factory has provided this car radio with a specific four-digit Security Code.
If the Security Code has been activated and the power supply is interrupted, the radio will not operate until the **correct** code has been entered.
If an **incorrect** code is entered, a warning tone will be heard and the radio mutes. A 'waiting period' of 1 minute then follows. Another code (even the correct code) cannot be entered until the waiting period is over. During and after the waiting period the radio is muted.
Each time an incorrect code is entered, the waiting period is doubled (2 min., 4 min., 8 min., 16 min. etc.). If the radio is switched off before the end of a waiting period, the same period will start all over again at the moment the radio is switched on.

Activating the Security Code

- While keeping the > button pressed, switch on the radio, and **keep the > button pressed** until a beep is heard.

The Security Code is now active.

If the Security Code is active the display briefly shows 'CODE' each time the radio is switched on.

Entering the Security Code

- Enter the four-digit Security Code using the [0-9] digit buttons on the keyboard.
- Press the [enter] button.

If the **correct code** was entered, you will hear a confirmation beep and the radio will function normally.

If however an **incorrect code** had been entered, you will hear a warning tone. The display shows 'Err' flashing.
You must now wait for 1 minute before another code can be entered.

During this waiting period the radio refuses all codes, even the correct code.

Do not switch off the radio during the waiting period! The waiting time will start all over again when the set is switched on.

After the waiting period is over the display shows 'CODE'. You can then enter the correct code (as described above).

Deactivating the Security Code

- While keeping the > button pressed, switch on the radio, and **keep the > button pressed** until the display shows 'CODE'.
- Enter the code (using the [0-9] digit buttons and the [enter] button) as described in 'Entering the Security Code'.

You will hear **two** beeps indicating that the Security Code is deactivated.

SOUND ADJUSTMENT

Volume, fader (front/rear control), balance, treble and bass are adjusted using the large rotary knob.
The normal function of this knob is volume. However, if you first press the AUDIO selector one or more times, the function of the large knob changes to fader, balance, treble or bass. The desired adjustment can then be made.
About 10 seconds later, the function of the large knob automatically returns to volume. Alternatively, you can return to volume control immediately, by keeping the AUDIO selector pressed for about 2 seconds.
The bass and treble settings for FM, FM INFO (DK), AM (MW & LW & SW) and for cassette operation are stored independently!

RADIO RECEPTION

- To select FM, LW or MW, press the BAND selector one or more times.
- To select a short-wave band, press the SW button one or more times.

The display indicates the selected waveband.

Tuning to a station

You can tune to a radio station using any of the methods:

– Search tuning
– Manual tuning
– Auto-Store (on FM and MW only)
– Direct entry of frequency
– Recalling a preset station

Note: If you want to tune to a frequency **between** the metre bands on SW, use 'manual tuning' or 'direct entry of frequency'.

Search tuning

You can quickly search for a station upwards or downwards in frequency.

- Select the desired waveband with the BAND selector or SW selector.

- Briefly press the < or the > button.

You will receive a station after a short time.

- Press the same button again.

You will receive the next station in the direction of the search.

When the highest frequency (e.g. for FM: 108 MHz) is reached the tuning switches automatically to the lowest frequency (for FM: 87.5 MHz) and vice versa.

Search tuning occurs on different 'sensitivity levels' (except on SW). First the radio searches for strong stations. If no station is found after the whole waveband has been scanned, the radio will search for less-strong stations. If again no station is found, the radio will search for weak stations.

On SW, search tuning remains **within** the selected metre-band (and on one sensitivity level).

If the radio tunes to a station which has been stored on one of the presets, the display will also show the relevant preset number (except on SW).
In the INFO mode the radio will only search for INFO stations.

Manual tuning

- Switch from search tuning mode to manual tuning mode by pressing **both** < and > buttons at the same time until you hear a beep.
- Press the < or > button.

Keeping the button pressed changes the frequency quickly. Briefly pressing the button changes the frequency by one step (50 kHz on FM or 1 kHz on MW, LW and SW).

The < and > buttons return to **search tuning** mode after:

- they are out of use for approximately 1 minute;
- the radio is switched **off** and **on** again; or
- the BAND selector, the SW selector, one of the preset buttons or the AST button is operated.

AUTO-STORE (on FM and MW only)

Auto-Store is an automatic search tuning system which stores the five strongest stations on the AST presets 1-5.

Storing stations:

a Select FM or MW with the BAND selector.
b Keep the AST button pressed until you hear a beep.

If LW or SW is selected the radio gives a warning tone to indicate an error.

The radio mutes, the display shows 'AST' flashing and the frequency indication disappears.
The selected waveband is scanned and the five strongest stations are automatically stored on the five presets.
The radio gives a beep when it has finished storing the stations.

- The radio then switches to the Auto-Store station on preset 1.
- You can select the Auto-Store stations with the presets 1-5.

The display shows the frequency and the Auto-Store preset number.

Recalling Auto-Store stations

a Select FM or MW with the BAND selector.
b Briefly press the AST button.

The display shows 'AST'.

c Select Auto-Store stations using the presets 1-5.

- To leave the Auto-Store mode, press the BAND selector.

The 'AST' indication goes out and the radio returns to normal operation on the current waveband.

Notes:

If under certain circumstances it is not possible for the radio to find five stations, the remaining presets (e.g. 4 and 5) are programmed with '0000'. If you later select such a preset the radio will mute.

If one of the stations is not desired (e.g. preset 4 has the same programme as preset 2), you can store the next strongest station by keeping the preset with the unwanted station pressed until the 'AST' indication starts flashing. You will hear a beep, indicating that a new station has been stored on this preset.

If a station with traffic information is found, the INFO mode is stored automatically. (See 'TRAFFIC INFORMATION'.)

Transferring an AUTO-STORE station to a normal FM or MW preset.

- Recall the Auto-Store station.
- Briefly press **both** tuning buttons < and > simultaneously. The preset number disappears, but the frequency displayed does not change.
- Keep the required preset button pressed until you hear a beep.

The station is stored under the selected preset and the radio switches to normal operation on the current waveband.

DIRECT ENTRY OF FREQUENCY

This is the quickest way of tuning if you know the frequency of the required station.

- Select the desired waveband with the BAND selector or SW selector.
- Type-in the desired frequency using the [0-9] digit buttons on the keyboard.
- Press the [enter] button.

The radio tunes to the selected frequency.

If an incorrect frequency for the current waveband is entered the radio gives an error beep and the display shows '0000'.

PRESETS

You can store stations on **each** waveband on the preset buttons 1-5.

For short wave, see 'SHORT-WAVE PRESETS'.

Storing Stations:

a Select the desired waveband with the BAND selector.
b Tune-in the desired station using the < or > buttons, or [0-9] digit buttons on the keyboard.
c Keep the desired preset (e.g.P1) pressed until a beep indicates that the frequency has been stored.

The display shows: the waveband, the frequency and the preset number on which the station has been stored.

Recalling stations

a Select the desired waveband with the BAND selector.
b Briefly press the relevant preset 1–5.

Transferring a station from one preset to another

- Select the station to be transferred with the preset buttons 1–5.
- Press **both** tuning buttons < and > at the same time.

The preset indication disappears from the display.

- Keep the preset on which you want to store the station pressed until you hear a beep.

The station is now stored on this preset.

SHORT-WAVE PRESETS

On short-wave it is possible to store **up to 5** frequencies under **each** of the preset buttons 1-4 giving 20 possible 'locations'. This is achieved by using preset 5 to switch between the different locations on each preset button.
It is therefore **not** possible to store a short-wave station on preset 5.

If you select a preset with no frequencies stored, the radio will mute and the display shows '0000'.

Storing a short-wave station

- Select the required preset location with presets 1–4 and location switch 5.
- Tune to the desired frequency.
- Press the required preset 1–4 until you hear a beep.

The frequency is now stored under the selected location.

Clearing a short-wave location

- Select the required preset location with presets 1–4 and location switch 5.
- Press the [0-dig] digit button on the keyboard.
- Press the [enter] button.

The radio gives a beep and then mutes. The display shows '0000'.

- Keep the required preset button (1–4) pressed until you hear a beep.

The location is now cleared.

TRAFFIC INFORMATION (on FM only)

This car radio can identify FM stations which broadcast traffic information on the SK/DK traffic system. This enables you to easily tune to a station which broadcasts traffic information. If you wish, you can mute the sound of the radio apart from traffic messages, or allow traffic messages to interrupt cassette playback.

If the currently-tuned station broadcasts SK/DK traffic information, 'SK' lights on the display.

Tuning to a TRAFFIC INFORMATION station

- To tune in to a station which broadcasts traffic messages, press the INFO button.

The radio is now in the **INFO mode.** The display shows 'INFO'.

The display shows 'SK' only if the currently-tuned station broadcasts traffic information.

If the radio is **not** tuned to a traffic information station, you will hear a warning tone and the radio will automatically search for a station which does broadcast traffic information.
If you are tuned to a station which becomes too weak, or if the broadcaster temporarily switches off the SK signal, the radio will start searching for another traffic information station. This is indicated by a warning tone. You will then hear a new station.

If the radio is in the INFO mode and you tune to another station using manual tuning, you will hear repetitive beeps for approx. 1 minute.

If no traffic information station can be found, the warning tone will be repeated every 30 seconds.

- You can stop these warning tones by pressing the INFO button to switch off the INFO mode.

Note: If the radio is in the INFO mode before storing an FM station, the INFO mode will also be stored. Later when selecting this FM preset, you need not press the INFO button again.

Receiving TRAFFIC INFORMATION only

- If the radio is in the INFO mode and you want to receive traffic information only, press the MUTE button.

The radio mutes. The display shows 'MUTE', 'SK' and 'INFO'. When a traffic message is broadcast, the radio will automatically switch to the previously adjusted sound level. After the message the radio mutes again.

- To return to normal radio reception, press the MUTE button once more.

'MUTE' disappears from the display.

Note: Pressing any radio button also switches off the mute mode.

TRAFFIC INFORMATION during cassette playback

If the radio is in the INFO mode and you play a cassette, playback will be interrupted by traffic messages when broadcast.

CLOCK

This radio incorporates a clock. You can use this for displaying the time or as a timer.

Setting the clock

- If necessary press the [F/T] selector on the keyboard to display the time.
- Keep the [F/T] selector pressed until a beep is heard and the time flashes on the display.
- Type in the correct time (in 24-hour form) using the [0-9] digit buttons.
- Press the [enter] button.

The radio beeps and the time stops flashing to indicate that the clock is set.
The display returns to its previous reading as soon as you press [F/T] selector or any other button (apart from the digit buttons).

Displaying the time

- Press the [F/T] selector on the keyboard.

The time is displayed.

The display returns to its previous reading as soon as you press [F/T] selector or any other button (apart from the digit buttons).

Timers

This radio incorporates **three** timers. This means you can program the radio to automatically tune-in up to three different stations every day at different times.

Before using the timers first check that the clock is set to the correct time!

Programming a timer

- Press the [F/T] selector to display the current time.
- Select the timer you want to program by keeping the corresponding digit button [1–3] pressed until 'TIMER' flashes on the display.

The display shows the selected timer number and its current setting.
':0' is displayed if this timer is not programmed at present.

Note: In the timer-programming mode the AUDIO button is not operational.

Setting the time:

- **If** the time displayed is the desired start-time, just press the [enter] button.
- **If not**, type-in the required start-time using the [0-9] digit buttons and then press the [enter] button.

An incorrect time entry will result in an error beep being heard. The radio will then wait for you to enter the correct time.

Setting the frequency of the radio station:

The display now shows the waveband and frequency of the currently-tuned station. (Note that this is **not** the current setting for the selected timer!)

- Press the [F/T] selector.

The radio retunes to the current frequency setting for the selected timer.

To change this setting:

- Select the desired waveband with the BAND selector or SW selector.
- Tune to the required frequency by: direct entry of frequency, manual tuning or recalling a preset.

If an invalid frequency is entered (via the keyboard) the radio waits for you to enter a valid frequency.

- Press the [enter] button to program the frequency.

The display shows 'TIMER' to show that one (or more) of the timers is active.
You are now out of the timer programming mode. The radio retunes to the radio station on the last-selected preset on the current waveband.

Providing the radio is switched on, the frequency programmed will be automatically tuned-in at the selected time.
The timer station will interrupt the following:

- listening to a station on another frequency;
- mute mode;
- cassette playback.

The timer station will **not** be tuned-in if the radio is in the INFO mode.
If cassette playback has been interrupted by a timer station, you can return to cassette playback by ejecting and reinserting the cassette.

If you have programmed the same start-time on more than one timer, only the frequency of the **lowest** timer number will be tuned-in.

Checking a timer

This feature allows you to quickly view the current settings of a timer. The start-time and frequency setting will be displayed one after another.

- Press the [F/T] selector to display the current time.
- Select the timer you want to check by briefly pressing the corresponding digit button [1–3].

The radio gives a beep.

The display shows 'TIMER' and the selected timer number.
The time setting is displayed for about 4 seconds.

':0' is displayed if this timer is not programmed.
The frequency setting is then displayed for 4 seconds.
Note that the radio does **not** let you hear the station on this frequency during the checking period!

The display then returns to the current time indication.

Note: If at any time during the checking of the timer one of the radio buttons is pressed, the checking mode is terminated. The radio returns to the currently-tuned frequency.

Switching off a timer

- Press the [F/T] selector to display the current time.
- Select the timer you want to switch off by keeping the corresponding digit button [1-3] pressed until 'TIMER' flashes on the display.

The display shows the selected timer number and its current setting.

- Press the [0–digit] button.
- Press the [enter] button.

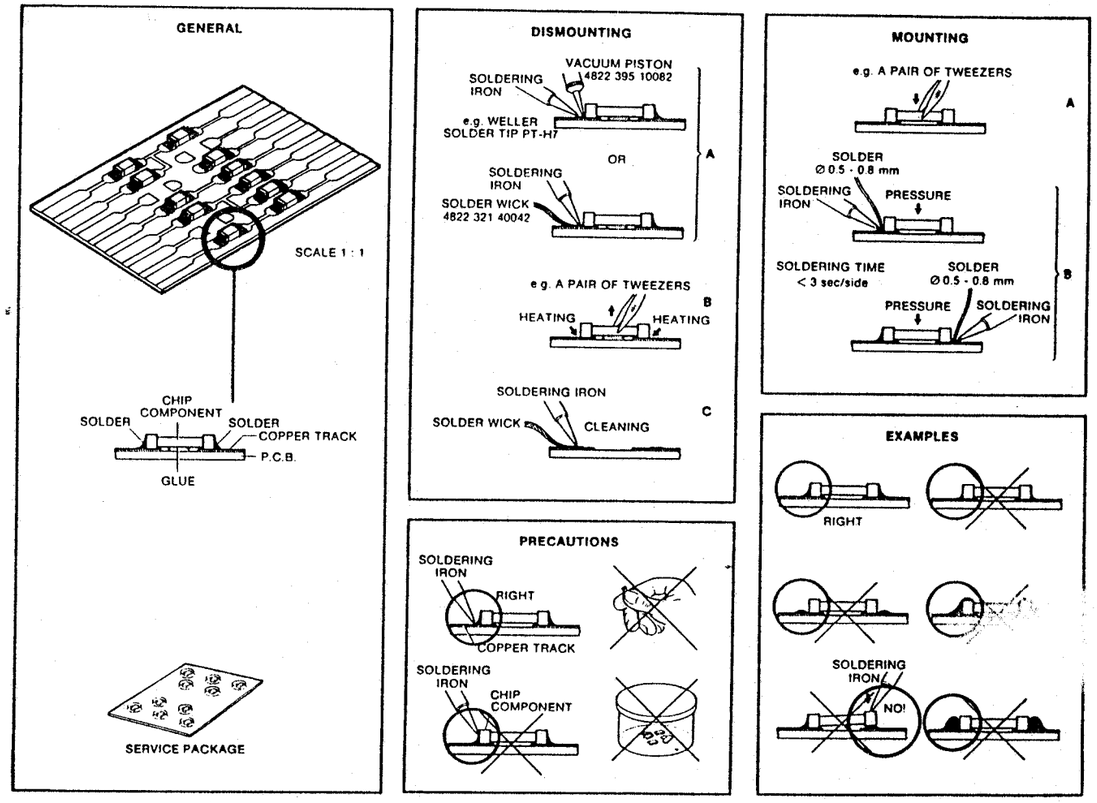
This timer is now switched off. The radio retunes to the radio station on the last-selected preset on the current waveband.

3.4 REPAIR HINTS

Disassembly

- For mounting/demounting instructions of the door unit refer to the exploded view.
- To perform measurements on the stereo decoder panel it will be necessary to remove the tape deck.
- To prevent metal parts from bending the tape deck may not be removed from the set at the cassette lift.

3.4.1 HANDLING CHIP COMPONENTS



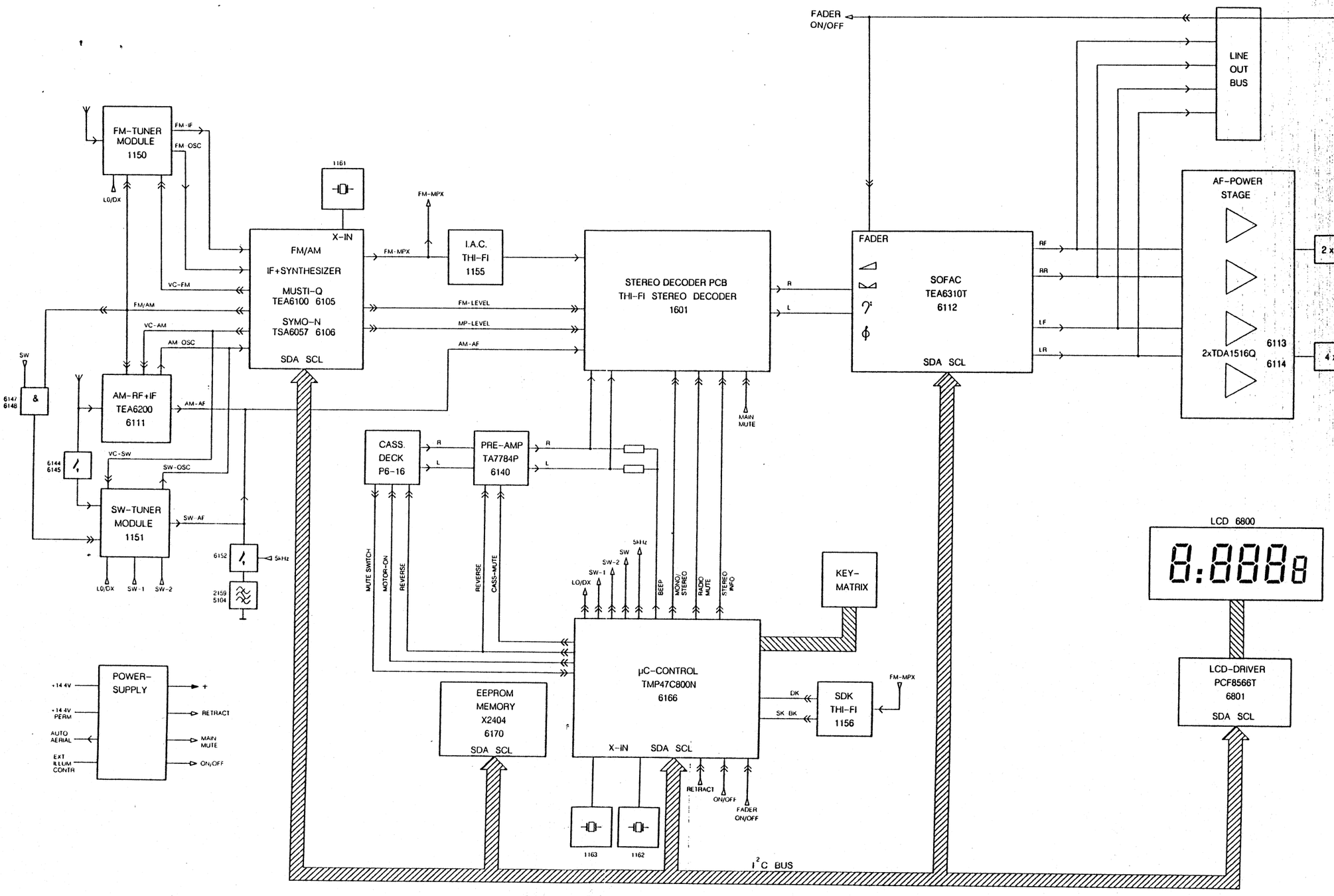
3.4.2 SURVEY OF SYMBOLS

Carbon film 0.2 W CR16	70°C	5%	
Carbon film 0.33 W CR25	70°C	5%	
Carbon film 0.5 W CR37	70°C	5%	
Standard film 0.5 W SFR16T	70°C	5%	
Standard film 0.4 W SFR25	70°C	5%	
Metal film 0.6 W MRS25	70°C	5%	
Safety resistor			
Chip jumper 0E			
Chip component			

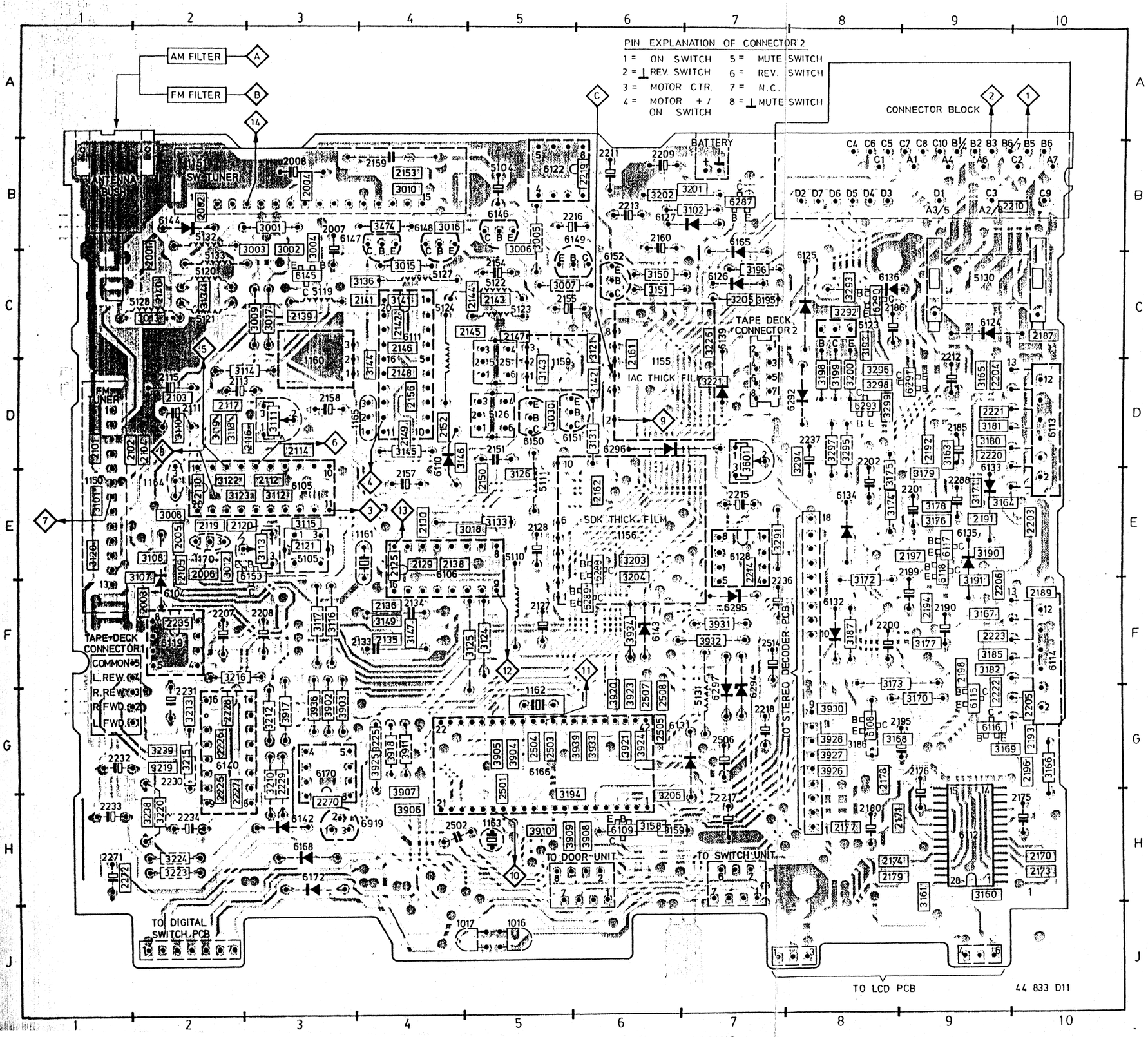
Plate ceramic Tuning < 120 pF		2%
Plate ceramic Others		—20/+80%
Tubular ceramic		
Polystyrene film / foil		1%
Polyestor Film / foil		10%
Mylar		10%
Electrolytic		

a	2,5 V
b	4 V
c	6,3 V
d	10 V
e	16 V
f	25 V
g	40 V
h	63 V
i	100 V
l	125 V
m	150 V
n	160 V
q	200 V
r	250 V
s	300 V
t	350 V
u	400 V
v	500 V
w	630 V
x	1000 V
A	1,6 V
B	6 V
C	12 V
D	15 V
E	20 V
F	35 V
G	50 V
H	75 V
I	80 V

4. BLOCKDIAGRAM

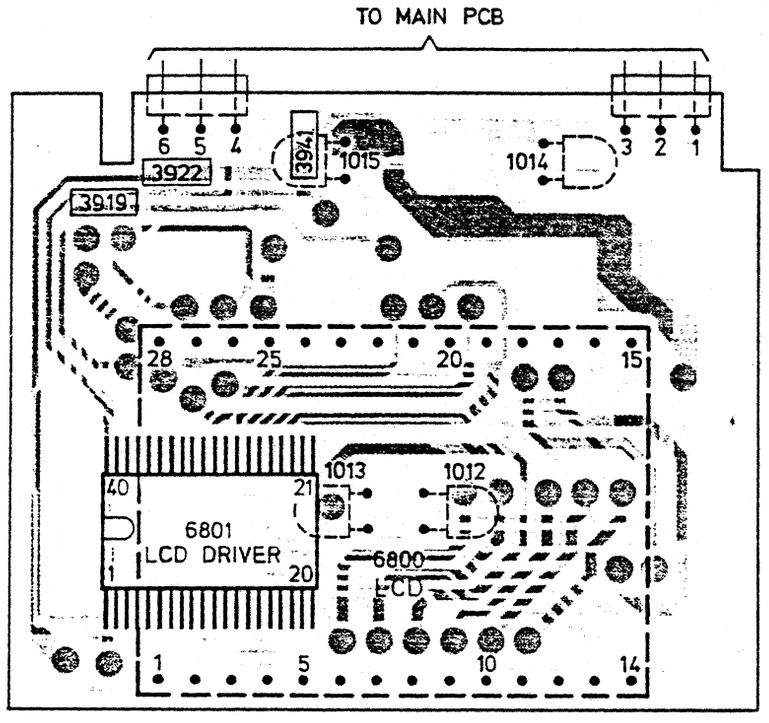


5.1 MAIN PCB

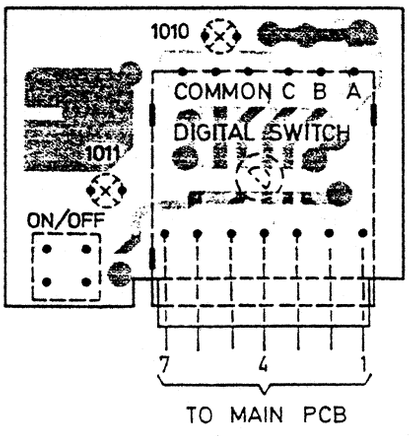


1016	J5	2196	G10	3133	E5	3920	G6
1017	J5	2197	E9	3134	C2	3921	G6
1150	E1	2198	F9	3136	C4	3923	G6
1151	B2	2199	E9	3141	C4	3924	G6
1155	D6	2200	F8	3142	D6	3925	G4
1156	E6	2201	E9	3143	D5	3926	G8
1159	D5	2202	D8	3144	D4	3927	G8
1160	D3	2203	E10	3145	D4	3928	G8
1161	E4	2204	D9	3146	D4	3930	G8
1162	G5	2205	G10	3147	F4	3931	F7
1163	H5	2206	F9	3149	F4	3932	F7
1164	E2	2207	F2	3150	C6	3933	G6
1165	D4	2208	F3	3151	C6	3934	F6
1170	E2	2209	B6	3158	H6	3936	G3
2001	C2	2210	B10	3159	H6	3939	G6
2002	B2	2211	B6	3160	H9	5104	B5
2003	F2	2212	C9	3161	H9	5110	E5
2004	B3	2213	B6	3163	D9	5111	E5
2005	E2	2214	E7	3164	E9	5119	C3
2006	E2	2215	E7	3165	D9	5120	C2
2007	B3	2216	B5	3166	G10	5121	C2
2008	B3	2217	H7	3167	F9	5122	C5
2101	D1	2218	G7	3168	G8	5123	C5
2102	D2	2219	B6	3169	G9	5124	C4
2103	D2	2220	D9	3170	G9	5125	D5
2104	D2	2221	D9	3171	E9	5126	D5
2105	E2	2222	G9	3172	E8	5127	C4
2110	E2	2223	F9	3173	F8	5128	C2
2111	D2	2225	G2	3174	E8	5130	C9
2112	E3	2226	G2	3175	E8	5131	G7
2113	D2	2227	G2	3176	E9	5132	B2
2114	D3	2228	G2	3177	F9	5133	C2
2115	D2	2229	G3	3178	E9	6104	F2
2116	D3	2230	G2	3179	E9	6105	E3
2117	D2	2231	G2	3180	D9	6106	D4
2119	E2	2232	G1	3181	D9	6108	G3
2120	E2	2234	H2	3182	F9	6109	F3
2121	E3	2235	F2	3185	F9	6110	D4
2125	E4	2236	F7	3186	G8	6111	G4
2127	F5	2237	D8	3187	F8	6112	H9
2128	E5	2270	H3	3190	E9	6113	D10
2129	E4	2271	G1	3191	F9	6114	F10
2130	E4	2272	G1	3193	C8	6115	G9
2133	F4	2288	E9	3194	H5	6116	G9
2134	F4	2501	G5	3195	C7	6117	E9
2135	F4	2502	H4	3196	C7	6118	E9
2136	F4	2503	G5	3198	D8	6119	F2
2138	E4	2504	G5	3199	D8	6122	B5
2139	C3	2505	G6	3200	D8	6123	C8
2140	C2	2506	G7	3201	B7	6124	C9
2141	C4	2507	G6	3202	B6	6125	C8
2142	C4	2508	G6	3203	E6	6126	C7
2143	C5	2514	F7	3204	E6	6127	B6
2144	C5	3001	B3	3205	C7	6128	E7
2145	C5	3002	B3	3206	H6	6131	G6
2146	C4	3003	B3	3210	G3	6132	F8
2147	C5	3004	B3	3212	G3	6133	D9
2148	D4	3005	B5	3213	G2	6134	E8
2149	D4	3006	B5	3215	G2	6135	E9
2150	E5	3007	C5	3216	F2	6136	C8
2151	D5	3008	E2	3219	G2	6139	C7
2152	D4	3009	C3	3220	H2	6140	G2
2153	B4	3010	B4	3221	D7	6142	H3
2154	C5	3012	E2	3223	H2	6143	F6
2155	C5	3013	C2	3224	H2	6144	B2
2156	D4	3015	C4	3225	G4	6145	C3
2157	E4	3016	B4	3226	C7	6146	B5
2158	D3	3017	C3	3238	H2	6147	B3
2159	B4	3018	E5	3239	G2	6148	B4
2160	B6	3030	D5	3291	E7	6149	B5
2161	C6	3101	E1	3292	C8	6150	D5
2162	E6	3102	B7	3293	C8	6151	D5
2170	H10	3107	E2	3294	D8	6152	C6
2171	H9	3108	E2	3295	D8	6153	E3
2173	H10	3110	D2	3296	D8	6165	B7
2174	H8	3111	D3	3297	D8	6166	G5
2175	H10	3112	E3	3298	D8	6168	H3
2176	G9	3113	E3	3299	D8	6170	G3
2177	H8	3114	D2	3474	B4	6172	H3
2178	G8	3115	E3	3601	D7	6287	B7
2179	H8	3116	F3	3902	G3	6288	E6
2180	H8	3117	F3	3903	G3	6289	F6
2185	D9	3118	D2	3904	G5	6290	C8
2186	C8	3119	D2	3905	G5	6291	D9
2187	C10	3120	E1	3906	H4	6292	D8
2189	F10	3121	C6	3907	H4	6293	D8
2190	F9	3122	E2	3908	H6	6294	G7
2191	E9	3123	E2	3909	H5	6295	F7
2192	D9	3124	F5	3910	H5	6296	D6
2193	G10	3125	F5	3911	G4	6297	G7
2194	F9	3126	E5	3917	G3	6919	H4
2195	G9	3131	D6	3918	G4		

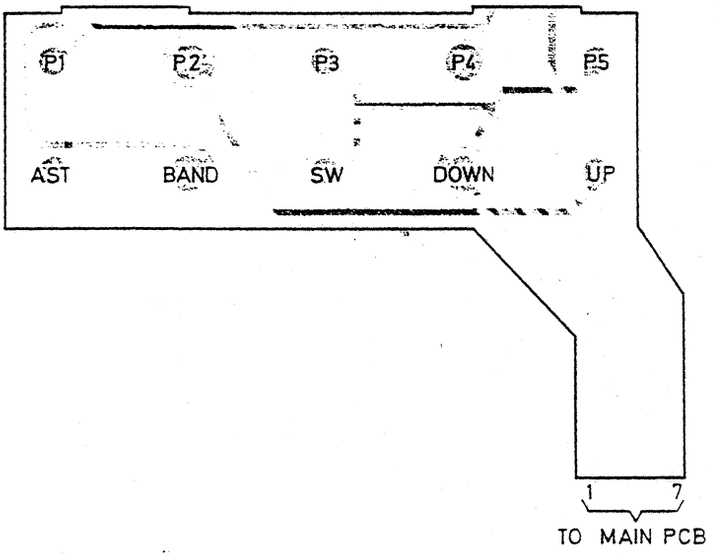
5.5 LCD PCB



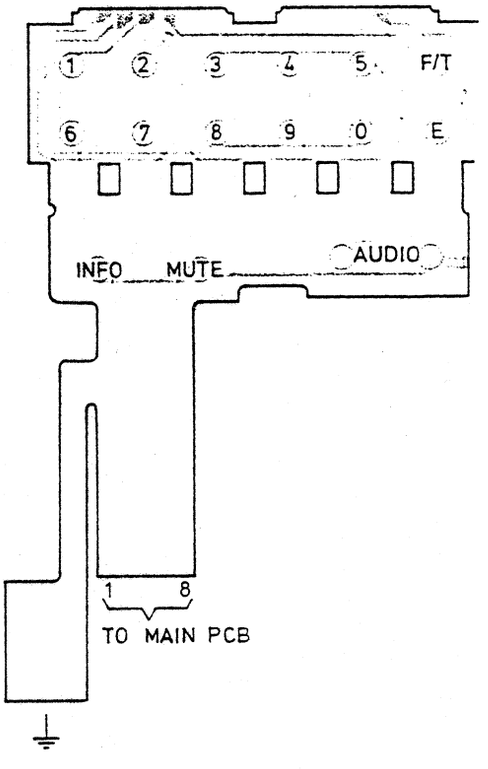
5.6 DIGITAL SWITCH PCB



5.7 SWITCH UNIT SWITCH FOIL



5.8 DOOR UNIT SWITCH FOIL



5.2 Survey of DC-Voltages

... V any position
... V FM position FM
... V AM position MW/LW
... V SW position SW
... V BK position FM + SK + BK
... V DK position FM + SK + BK + DK
... V < position forward play
... V > position reverse play

extension "*" means signal strength dependent.

+ 1	-	14.3V	+ 4	-	5.0V
+ 2	-	14.2V	+ 4a	-	5.0V
+ 3	-	8.4V	+ 5	-	5.0V
+ 3a	-	8.4V	+ 6	-	5.0V
+ 3b	-	7.8V	+ 8	-	13.5V

1050 FM-TUNER

1 - GND
2 -
3 - GND
... A LO (AST search)
... FM DX (AST search)
... FM

... STEREO DECODER THI-FI

1 - 0.7V FM-stereo
5.0V FM-mono
2 - 0.0-3.5V FM *
3 - 3.4V
4 - 2.5V
5 - 2.6V
6 - GND
7 - 0.1-1.9V FM *
8 - 8.3V
9 - 0.7-5.0V FM *
10 - 0.5-6.0V FM *
11 - 0.0V FM-stereo
5.0V FM-mono
12 - 0.0-3.5V FM *
13 - 5.0V muted
0.0V
14 - 0.0 -4.0V (power on/off)
15 - 3.4V FM
16 - 2.6V FM
17 - 3.4V FM
18 - 3.4V FM
19 - 3.4V FM
20 - 3.4V FM

6105 TEA6100

1 - 8.4V
2 - 0.6V
3 - 0.5-6.0V FM *
0.0V AM,SW
4 - 0.0V FM
2.0V AM,SW
5 - 0.4V FM
0.8-6.0V AM,SW *
6 - 40 kHz
7 - GND
8 - 8.3V
9 - 4.6V (SCL)
10 - 4.6V (SDA)
11 - 4.0V FM
3.2V AM,SW
12 - 4.6V
13 - 4.6V
14 - 2.4V FM
1.8V AM,SW
15 - 4.4V FM
3.6V AM,SW
16 - 3.0V
17 - 3.0V
18 - 3.0V
19 - 3.0V
20 - GND

6106 TSA6057

1,2 - 4 MHz
3 - 4.7V
4 - GND
5,6,7 - 1.8V
8 - 0.0V SW,FM
8.0V AM
9 - 40 kHz
10 - 4.6V (SDA)
11 - 4.6V (SCL)
12 - GND
13 - 1.0-5.0V VC-AM
1.0-6.0V VC-FM
14 - 2.4V
15 - 2.0-8.0V VC-SW
16 - 9.9V

6108 BC847B

e - GND
b - 0.7V FADER ON
0.0V FADER OFF
c - 0.0V FADER ON
6.2V FADER OFF

6109 BC547B

e - 5.0V FADER ON
0.0V FADER OFF
b - 4.3V FADER ON
0.0V FADER OFF
c - 5.0V

6111 TEA6200

1 - 6.6V AM
2 - 4.0V AM
3,4,5,6 - 8.2V AM
7 - 0.7V AM
8,9,10 - 4.0V AM
11 - 6.7V AM
12 - 1.2V AM
13 - 4.7V AM
14 - 8.0V AM
0.0V FM,SW
15,16 - 4.7V AM
0.0V FM
17 - GND
18 - 0.0V AM
1.0V FM
19 - 1.3V AM
20 - 3.3V AM

6112 TEA6310

1 - 4.8V (SDA)
2 - GND
3-7 - 3.9V
8 - N.C
9 - 6.9V FADER ON
0.0V FADER OFF
10 - N.C
11 - 7.7V
12-13 - N.C
14-15 - 3.9V
16-17 - N.C
18 - GND
19 - N.C
20 - 3.9V
21 - GND
22-26 - 3.9V
27 - 7.8V
28 - 4.8V (SCL)

6113/6114 TDA1516Q

1 - 2.2V
2 - 2.2V
3 - GND
4 - 2.2V
5 - 6.7V
6 - 14.3V
7 - GND
8 - 14.3V
9 - 6.7V
10 - 14.3V
11 - 14.2V
12 - 6.7V
13 - 2.2V

6115-6118 BC847B

e - 3.4V FADER ON
5.4V FADER OFF
b - 1.9V FADER ON
6.0V FADER OFF
c - 7.8V

6119/6122 L4916

1 - 14.2V
2 - 2.5V
3 - N.C
4 - 8.4V
5-8 - GND

6123 BD438

e - 14.3V
b - 13.5V
c - 14.2V

6128 L4904

1 - 12.8V
2 - 8.4V
3 - 5.6V
4 - GND
5 - N.C
6 - 4.2V
7-8 - 5.0V

6140 TA7784P

1 - 8.0V
2 - 2.6V >, <
0.0V cass.mute
3 - 0.0V >
4.8V <
4 - N.C
5 - 2.2V
6 - 2.2V
7 - 2.2V
8 - GND
9 - 2.2V
10 - N.C
11 - 2.2V
12 - 2.2V
13 - 2.2V
14 - N.C
15 - N.C
16 - 2.6V >, <
0.0V cass.mute

6145 BC847B

e - 0.0V
8.0V SW
b - 0.0V
8.6V SW
c - 8.4V

6146 BC558C

e - 5.0V
b - 4.3V SW-1
0.0V SW-2
c - 4.8V SW-1
0.0V SW-2

6147 BC558C

e - 8.4V
b - 8.1V AM,FM
7.9V SW
c - 0.0V AM,FM
8.4V SW

6148 BC547

e - 0.1V FM,SW
8.0V AM
b - 0.0V FM
1.0V AM
0.7V SW
c - 8.1V AM,FM
1.2V SW

6149 BC547

e - 5.0V
b - 0.0V SW-1
4.3V SW-2
c - 0.0V SW-1
4.8V SW-2

6150 BC558C

e - 14.2V
b - 13.4V
c - 9.9V

6151 BC547

e - 8.0V
b - 8.4V
c - 13.3V

6152 BC547

e - GND
b - 0.0V
4.5V min.treble
c -

6153 BC847B

e - GND
b - 0.7V
0.0V search
c - 0.0V

6169 MC78L05ACP

1 - 13.5V
2 - GND
3 - 5.0V

6170 X2404

1-4 - GND
5 - 4.8V (SDA)
6 - 4.8V (SCL)
7 - GND
8 - 5.0V

6287 BC847C

e - GND
b - 0.4V
c - 0.0V

6288 BC847B

e - GND
b - 0.6V
c - 0.0V

6289 BC847B

e - GND
b - 0.0V
c - 4.9V

6290 BC857B

e - 14.3V
b - 13.5V
c - 9.9V

6291 BC857B

e - 14.3V
b - 13.5V
c - 14.1V

6293 BC847B

e - GND
b - 0.7V
c - 0.2V

6601/6602 BC558C

e - 1.4V FM
b - 0.8-1.3V FM *
c - 0.0-1.4V FM *

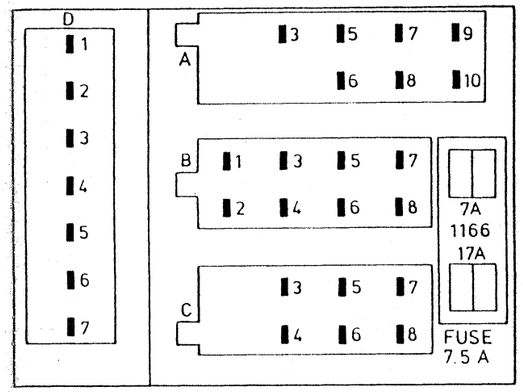
6604 BC547B

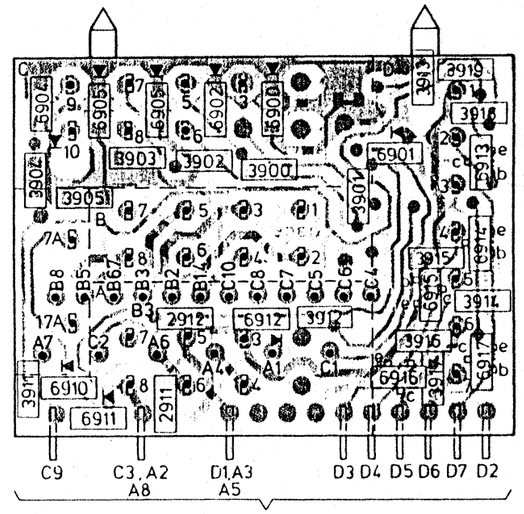
e - 0.0V FM
b - 0.1-0.6V FM *
c - 0.7-5.0V FM *

6606/6607 BC547B

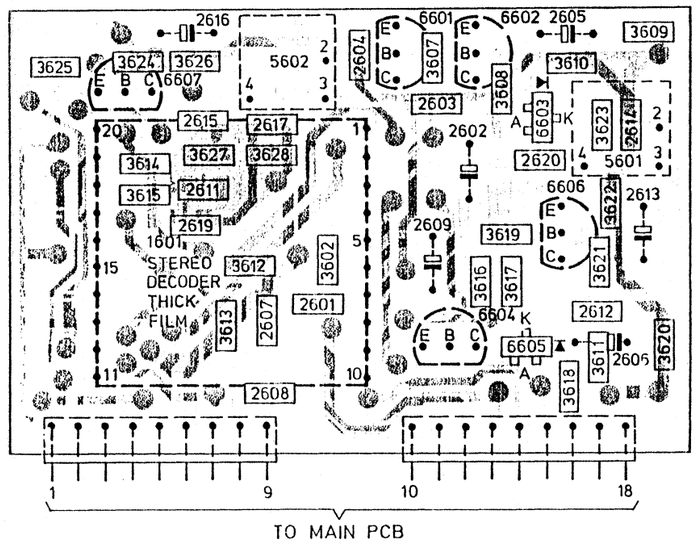
e - 1.9V
b - 2.6V
c - 5.5V

5.3 CONNECTOR BLOCK



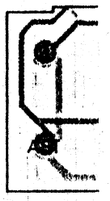


5.4 STEREO DECODER PCB

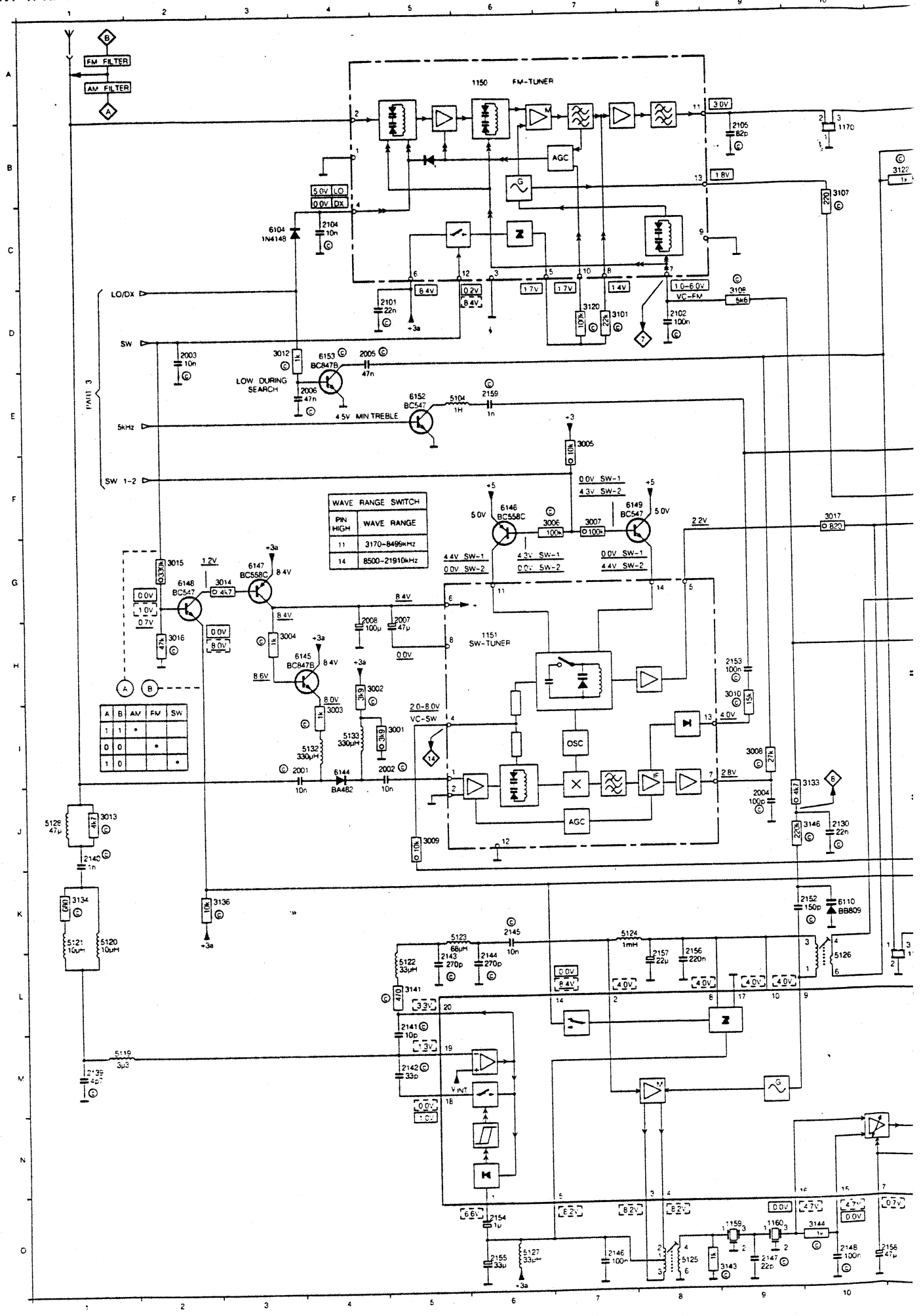


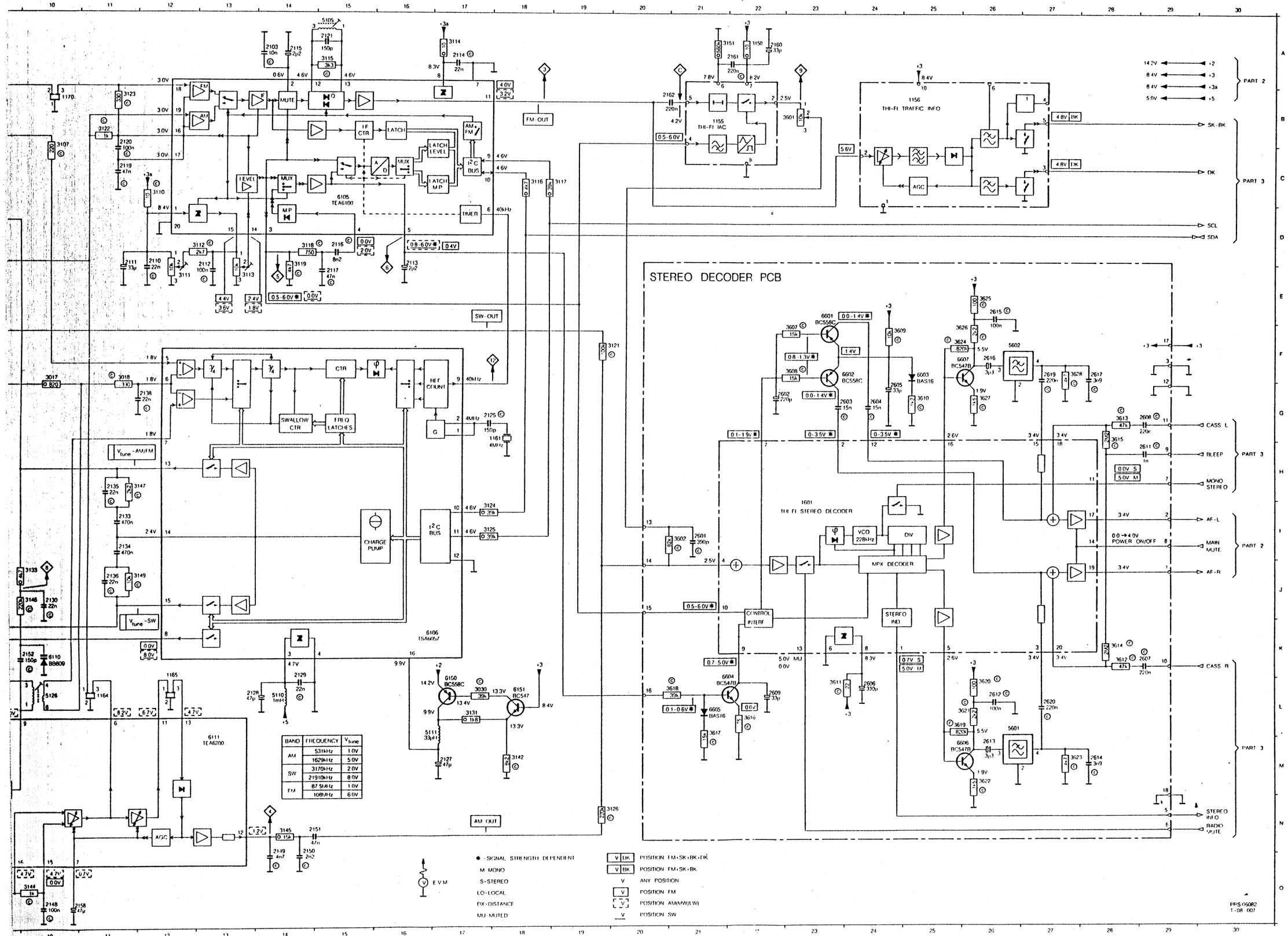
5.5 LCD

5.7 SWIT



6.1 PART 1: RF AND STEREO DECODER





1150 A6
1151 H6
1155 B21
1156 B25
1159 O9
1160 O9
1161 G17
1164 L11
1165 K12
1170 B10
1601 I 23
2001 I 4
2002 I 5
2003 D2
2004 J9
2005 D4
2006 E4
2007 H5
2008 H4
2101 D5
2102 D8
2103 A14
2104 C4
2105 B9
2110 D12
2111 E11
2112 E13
2113 E16
2114 A17
2115 A14
2116 D15
2117 E15
2119 C11
2120 B11
2121 A15
2125 G17
2127 M17
2128 L13
2129 K14
2130 J10
2133 I 11
2134 I 11
2135 H11
2136 J11
2138 G12
2139 M1
2140 J1
2141 L5
2142 M5
2143 L5
2144 L6
2145 K6
2146 O7
2147 O9
2148 O12
2149 N14
2150 K
2151 K
2152
2160
2161 A22
2162 B20
2601 I 21
2602 G2
2603 G21
2604 G24
2605 G24
2606 L24
2607 K29
2608 G29
2609 L22
2611 H29
2612 L26
2613 M26
2614 M28
2615 E26
2616 F26
2617 F28
2619 F27
2620 L27
3001 I 5
3002 H4
3003 I 4
3004 H3
3005 E7
3006 F7
3007 F7
3008 I 9
3009 J5
3010 I 9
3012 D3
3013 J1
3014 G3
3015 G2
3016 H2
3017 F10
3018 F11
3107
3110 C12
3111 E12
3112 D13
3113 E13
3114 A17
3115 A15
3116 C18
3117 C19
3118 D14
3119 E14
3120 D7
3121 F19
3122 B11
3123 B11
3124 I 17
3125 I 17
3126 N19
3131 L17
3133 J10
3134 K1
3136 K2
3141 L5
3142 M18
3143 O8
3144 O10
3145 N14
3146 J10
3147 H11
3149 J11
3150 A22
3151 A21
3601 B23
3602 I 21
3607 F23
3608 F23
3609 F24
3610 G25
3611 L23
3612 K28
3613 G28
3614 K28
3615 G28
3616 L22
3617 L21
3618 L21
3619 L25
3620 L26
3621 L25
3622 M26
3623 M27
3624 F25
3625 E26
3626 F25
3627 G26
3628 F27
5104 E6
5105 A15
5110 L14
5111 L17
5119 M1
5120 K1
5121 K1
5122 L5
5123 K5
5124 C7
5125 O8
5127 O6
5128 J1
5132 I 4
5133 I 4
5601 L26
5602 F26
6104 C3
6105 C15
6106 K16
6110 K10
6111 L13
6144 I 4
6145 H4
6146 F6
6147 G3
6148 G2
6149 F8
6150 K17
6151 L18
6152 E5
6153 D4
6801 E23
6802 F24
6803 F25
6804 K22
6805 L21
6806 M26
6807 F26

90DC777

9.1 Mechanical partslist

Only those parts of which the item number is stated below are considered service parts.

14	4822 443 30463	
15	4822 492 63822	
24	4822 267 30883	
26-28	4822 267 50831	
50	4822 701 10609	
60	4822 410 26128	
62	4822 410 26129	
90	4822 380 20365	
94	4822 462 71642	
100-108	4822 410 60562	
110	4822 404 21076	
112	4822 410 26863	
114	4822 454 12241	
115	4822 459 50564	/02
115	4822 459 50574	/32
122	4822 404 21078	
124	4822 466 92675	
140	4822 443 62947	/02
140	4822 443 63012	/32
142	4822 410 60558	
143	4822 410 60558	
144	4822 410 60559	
145	4822 276 80383	
146	4822 276 80382	
148	4822 466 10585	
150	4822 423 90138	/02
150	4822 423 90145	/32
152	4822 492 70505	
156–160	4822 404 21081	
170	4822 691 10302	
198	4822 410 60561	
199	4822 492 70506	
221	4822 404 21077	
222	4822 276 12405	
228	4822 276 11517	
232	4822 413 41485	
234	4822 404 10776	
236	4822 410 26862	
239	4822 466 70647	
250/1-4	4822 459 50566	/02
250/1-4	4822 459 50575	/32
250/2,3	4822 443 62947	/02
250/2,3	4822 404 21101	/32
254	4822 443 62948	/02
254	4822 443 63013	/32
256	4822 492 42313	
464/1	4822 321 60296	
465/1	4822 321 10551	
480/2	4822 404 20437	

Screw dimensions

16	M3x10
22	M2.5x6
25	M2.5x6
46	M2.5x10
58	M2.5x6
224	M2.5x6

9.2 Electrical partslist

– Miscellaneous –

1010	4822 134 40981	Lamp 16V 50mA white /02
1010	4822 134 41019	Lamp 16V 50mA orange /32
1011	4822 134 40981	Lamp 16V 50mA white /02
1011	4822 134 41019	Lamp 16V 50mA orange /32
1012	4822 134 40981	Lamp 16V 50mA white /02
1012	4822 134 41019	Lamp 16V 50mA orange /32
1013	4822 134 40981	Lamp 16V 50mA white /02
1013	4822 134 41019	Lamp 16V 50mA orange /32
1014	4822 134 40981	Lamp 16V 50mA white /02
1014	4822 134 41019	Lamp 16V 50mA orange /32
1015	4822 134 40981	Lamp 16V 50mA white /02
1015	4822 134 41019	Lamp 16V 50mA orange /32
1016	4822 134 40981	Lamp 16V 50mA white
1017	4822 134 40981	Lamp 16V 50mA white
1150	4822 210 10381	FM-tuner module
1151	4822 210 10382	SW-tuner module
1155	4822 214 51676	THI-FI IAC
1156	4822 214 51674	THI-FI SDK
1159	4822 242 72076	10T7BB
1160	4822 242 72076	10T7BB
1161	4822 242 71874	Quartz crystal 4.0 MHz
1162	4822 242 70831	4 MHz CSA4MG
1163	4822 242 70938	Quartz crystal 32.768 kHz
1164	4822 242 71883	SFE10.7 MS 318–D
1165	4822 242 71883	SFE10.7 MS 318–D
1166	4822 252 51089	Fuse 7.5AT
1170	4822 242 72862	SFE10.7 MS2W
1601	4822 214 51677	THI-FI Stereo decoder

– C –

2001	4822 122 32442	50V 10nF ± 10%
2002	5322 122 34098	63V 10nF ± 10%
2003	5322 122 34098	63V 10nF ± 10%
2004	5322 122 32531	NPO 63V 100pF ± 5%
2005	4822 122 32542	50V 47nF ± 10%
2006	4822 122 32542	50V 47nF ± 10%
2007	4822 124 23178	16V 47µF ± 20%
2008	4822 124 23045	10V 100µF ± 20%
2101	5322 122 32654	63V 22nF ± 10%
2102	4822 122 31947	50V 100nF + 80% - 20%
2103	5322 122 34098	63V 10nF ± 10%
2104	5322 122 34098	63V 10nF ± 10%
2105	4822 122 33515	NPO 63V 82pF ± 5%
2110	5322 122 32654	63V 22nF ± 10%
2111	4822 124 23177	16V 33µF ± 20%
2112	4822 122 31947	50V 100nF + 80% - 20%
2113	4822 124 41971	50V 2µ2 ± 20%
2114	5322 122 32654	63V 22nF ± 10%
2115	4822 124 41971	50V 2µ2 ± 20%
2116	4822 126 10525	63V 8n2 ± 10%
2117	4822 122 32542	50V 47nF ± 10%
2119	4822 122 32542	50V 47nF ± 10%
2120	4822 122 31947	50V 100nF + 80% - 20%
2121	4822 126 10524	63V 150pF ± 5%
2125	5322 122 33538	NPO 63V 150pF ± 5%
2127	4822 124 23178	16V 47µF ± 20%
2128	4822 124 23178	16V 47µF ± 20%
2129	5322 122 32654	63V 22nF ± 10%
2130	5322 122 32654	63V 22nF ± 10%
2133	4822 121 43525	100V 470nF ± 10%
2134	4822 121 43525	100V 470nF ± 10%
2135	5322 122 32654	63V 22nF ± 10%
2136	5322 122 32654	63V 22nF ± 10%
2138	5322 122 32654	63V 22nF ± 10%
2139	4822 122 32082	NPO 50V 4p7 ± 0.25%
2140	5322 122 31647	50V 1nF ± 10%
2141	5322 122 32448	NPO 63V 10pF ± 5%
2142	5322 122 32659	NPO 63V 33pF ± 5%
2143	4822 122 33216	NPO 63V 270pF ± 5%
2144	4822 122 33216	NPO 63V 270pF ± 5%
2145	5322 122 34098	63V 10nF ± 10%
2146	4822 122 31947	50V 100nF + 80% - 20%
2147	5322 122 32658	NPO 63V 22pF ± 5%
2148	4822 122 31947	50V 100nF + 80% - 20%
2149	4822 122 33339	63V 4n7 ± 10%
2150	4822 122 33127	63V 2n2 ± 10%
2151	4822 121 43526	100V 47nF ± 5%
2152	5322 122 33538	NPO 63V 150pF ± 5%
2153	4822 122 31947	50V 100nF + 80% - 20%
2154	4822 124 41969	50V 1µF ± 20%
2155	4822 124 23177	16V 33µF ± 20%
2156	4822 122 32916	50V 220nF ± 10%
2157	4822 124 23176	16V 22µF ± 20%
2158	4822 124 23178	16V 47µF ± 20%
2159	4822 121 50566	250V 1nF ± 2%
2160	4822 124 23177	16V 33µF ± 20%
2161	4822 122 32916	50V 220nF ± 10%
2162	4822 122 32916	50V 220nF ± 10%
2170	4822 122 31981	50V 33nF ± 10%
2171	4822 122 31981	50V 33nF ± 10%
2173	4822 122 32646	63V 5n6 ± 10%
2174	4822 122 32646	63V 5n6 ± 10%
2175	4822 124 41973	16V 100µF ± 20%
2176	5322 124 41431	25V 22µF ± 20%
2177	4822 122 32916	50V 220nF ± 10%
2178	4822 122 32916	50V 220nF ± 10%
2179	4822 122 31947	50V 100nF + 80% - 20%
2180	4822 124 41973	16V 100µF ± 20%
2185	4822 124 42009	10V 2200µF ± 20%
2186	4822 124 42009	10V 2200µF ± 20%
2187	4822 122 31947	50V 100nF + 80% - 20%
2188	4822 124 22406	10V 47µF ± 20%
2189	4822 122 31947	50V 100nF + 80% - 20%
2190	4822 124 22406	10V 47µF ± 20%
2191	4822 122 32916	50V 220nF ± 10%
2192	4822 122 32916	50V 220nF ± 10%
2193	4822 122 32916	50V 220nF ± 10%
2194	4822 122 32916	50V 220nF ± 10%
2195	4822 124 41395	16V 33µF ± 20%
2196	4822 122 31947	50V 100nF + 80% - 20%
2197	4822 122 32916	50V 220nF ± 10%
2198	4822 122 32916	50V 220nF ± 10%
2199	4822 124 41399	63V 2µ2 ± 20%
2200	4822 124 41399	63V 2µ2 ± 20%
2201	4822 124 41399	63V 2µ2 ± 20%
2202	4822 124 41399	63V 2µ2 ± 20%
2203	4822 122 33216	NPO 63V 270pF ± 5%
2204	4822 122 33216	NPO 63V 270pF ± 5%
2205	4822 122 33216	NPO 63V 270pF ± 5%
2206	4822 122 33216	NPO 63V 270pF ± 5%
2207	4822 124 23176	16V 22µF ± 20%
2208	4822 124 41969	50V 1µF ± 20%
2209	4822 124 23178	16V 47µF ± 20%
2210	4822 122 31784	50V 4n7 ± 10%
2211	4822 124 23176	16V 22µF ± 20%
2212	4822 124 21681	16V 2200µF ± 20%
2213	4822 124 23176	16V 22µF ± 20%
2214	4822 122 31947	50V 100nF + 80% - 20%
2215	4822 124 23177	16V 33µF ± 20%
2216	4822 124 41969	50V 1µF ± 20%
2217	4822 124 23179	16V 10µF ± 20%
2218	4822 124 41395	16V 33µF ± 20%
2219	4822 122 31947	50V 100nF + 80% - 20%
2220	4822 122 33339	63V 4n7 ± 10%
2221	4822 122 33339	63V 4n7 ± 10%
2222	4822 122 33339	63V 4n7 ± 10%
2223	4822 122 33339	63V 4n7 ± 10%
2225	5322 116 80853	NPO 63V 560pF ± 5%
2226	5322 116 80853	NPO 63V 560pF ± 5%
2227	5322 116 80853	NPO 63V 560pF ± 5%
2228	5322 116 80853	NPO 63V 560pF ± 5%
2231	4822 124 23177	16V 33µF ± 20%
2232	4822 124 41395	16V 33µF ± 20%
2233	4822 124 41395	16V 33µF ± 20%
2234	5322 124 41431	25V 22µF ± 20%
2235	4822 122 31947	50V 100nF + 80% - 20%
2236	4822 124 41969	50V 1µF ± 20%
2237	4822 124 41398	63V 1µF ± 20%
2270	4822 122 31947	50V 100nF + 80% - 20%
2271	4822 124 41396	16V 220µF ± 20%
2272	4822 122 31947	50V 100nF + 80% - 20%
2501	5322 122 32658	NPO 63V 22pF ± 5%
2502	5322 125 50295	Trim. 50V 50pF
2503	5322 122 32659	NPO 63V 33pF ± 5%
2504	5322 122 32659	NPO 63V 33pF ± 5%
2505	4822 122 31947	50V 100nF + 80% - 20%
2506	4822 124 23177	16V 33µF ± 20%
2507	5322 122 32448	NPO 63V 10pF ± 5%
2508	5322 122 32448	NPO 63V 10pF ± 5%
2514	4822 124 41399	63V 3µ3 ± 20%
2601	4822 122 33172	NPO 63V 390pF ± 5%
2602	4822 124 22688	10V 220µF ± 20%
2603	4822 122 33899	63V 15nF ± 10%
2604	4822 122 33899	63V 15nF ± 10%
2605	4822 124 41395	16V 33µF ± 20%
2606	4822 124 40735	10V 330µF ± 20%
2607	4822 122 32916	50V 220nF ± 10%
2608	4822 122 32916	50V 220nF ± 10%
2609	4822 124 41395	16V 33µF ± 20%
2611	5322 122 34123	63V 1nF ± 10%
2612	4822 122 31947	50V 100nF + 80% - 20%
2613	4822 124 41401	63V 3µ3 ± 20%
2614	5322 126 10465	63V 3n9 ± 10%
2615	4822 122 31947	50V 100nF + 80% - 20%
2616	4822 124 41401	63V 3µ3 ± 20%
2617	5322 126 10465	63V 3n9 ± 10%
2619	4822 122 32916	50V 220nF ± 10%
2620	4822 122 32916	50V 220nF ± 10%
2910	4822 124 20688	16V 33µF ± 60%
2911	4822 122 31811	3n9 ± 10%
2912	4822 122 31811	3n9 ± 10%

– R –

3002	4822 051 20392	3k9 ± 5%
3003	4822 111 91516	1k ± 5%
3004	4822 111 91516	1k ± 5%
3006	4822 111 91518	100k ± 5%
3008	4822 116 90342	27k ± 5%
3010	4822 111 91498	15k ± 5%
3012	4822 111 91516	1k ± 5%

3013	4822 111 91532	4k7 ± 5%	
3016	4822 111 91661	47k ± 5%	
3018	4822 051 20331	330Ω ± 5%	
3030	4822 051 20393	39k ± 5%	
3101	4822 111 91523	22k ± 5%	
3107	4822 116 90339	220Ω ± 5%	
3108	4822 111 91534	5k6 ± 5%	
3110	4822 051 20109	10Ω ± 5%	
3111	4822 100 20166	Preset 10k	
3112	4822 051 20272	2k7 ± 5%	
3113	4822 100 20166	Preset 10k	
3115	4822 051 20332	3k3 ± 5%	
3118	4822 051 20751	750Ω ± 5%	
3119	4822 111 91532	4k7 ± 5%	
3120	4822 111 91518	100k ± 5%	
3121	4822 111 91518	100k ± 5%	
3122	4822 111 91516	1k ± 5%	
3123	4822 051 20331	330Ω ± 5%	
3126	4822 116 80881	220k ± 5%	
3134	4822 051 20681	680Ω ± 5%	
3136	4822 111 91517	10k ± 5%	
3141	4822 116 90446	470Ω ± 5%	
3142	4822 051 20822	8k2 ± 5%	
3143	4822 111 91516	1k ± 5%	
3144	4822 111 91516	1k ± 5%	
3146	4822 116 80881	220k ± 5%	
3147	4822 051 20272	2k7 ± 5%	
3149	4822 111 91517	10k ± 5%	
3158	4822 111 91518	100k ± 5%	
3160	4822 051 20393	39k ± 5%	
3161	4822 051 20393	39k ± 5%	
3163	4822 051 20272	2k7 ± 5%	
3164	4822 111 91498	15k ± 5%	
3165	4822 111 91498	15k ± 5%	
3167	4822 111 91498	15k ± 5%	
3168	4822 051 20332	3k3 ± 5%	
3169	4822 051 20392	3k9 ± 5%	
3171	4822 051 20392	3k9 ± 5%	
3174	4822 051 20683	68k ± 5%	
3176	4822 111 91498	15k ± 5%	
3177	4822 111 91498	15k ± 5%	
3178	4822 111 91498	15k ± 5%	
3179	4822 111 91498	15k ± 5%	
3180	4822 051 20478	4Ω7 ± 5%	
3181	4822 051 20478	4Ω7 ± 5%	
3182	4822 051 20478	4Ω7 ± 5%	
3183	4822 051 20478	4Ω7 ± 5%	
3190	4822 116 90339	220Ω ± 5%	
3191	4822 116 90339	220Ω ± 5%	
3193	4822 111 91517	10k ± 5%	
3194	4822 111 91517	10k ± 5%	
3201	4822 111 91651	1M ± 5%	
3203	4822 111 91517	10k ± 5%	
3204	4822 111 91518	100k ± 5%	
3205	4822 111 91518	100k ± 5%	
3206	4822 051 20274	270k ± 5%	
3213	4822 051 20563	56k ± 5%	
3215	4822 111 91651	1M ± 5%	
3219	4822 116 81029	390Ω ± 5%	
3221	4822 111 91517	10k ± 5%	
3226	4822 051 20392	3k9 ± 5%	
3238	4822 111 91534	5k6 ± 5%	
3239	4822 111 91534	5k6 ± 5%	
3292	4822 116 80881	200k ± 5%	
3293	4822 111 91522	2k2 ± 5%	
3294	4822 116 80881	220k ± 5%	
3296	4822 051 20393	39k ± 5%	
3298	4822 111 91498	15k ± 5%	
3299	4822 111 91517	10k ± 5%	
3601	4822 100 20166	Preset 10k	
3602	4822 051 20823	82k ± 5%	
3607	4822 111 91498	15k ± 5%	
3608	4822 111 91498	15k ± 5%	
3609	4822 111 91517	10k ± 5%	
3610	4822 051 20122	1k2 ± 5%	
3611	4822 051 20229	22Ω ± 5%	
3612	4822 111 91661	47k ± 5%	
3613	4822 111 91661	47k ± 5%	
3614	4822 051 20225	2M2 ± 5%	
3615	4822 051 20225	2M2 ± 5%	
3616	4822 111 91506	75Ω ± 5%	
3617	4822 111 91498	15k ± 5%	
3618	4822 051 20393	39k ± 5%	
3619	4822 051 20824	820k ± 5%	
3620	4822 116 90441	100Ω ± 5%	
3621	4822 111 91522	2k2 ± 5%	
3622	4822 051 20152	1k5 ± 5%	
3623	4822 111 91532	4k7 ± 5%	
3624	4822 051 20824	820k ± 5%	
3625	4822 116 90441	100Ω ± 5%	
3626	4822 111 91522	2k2 ± 5%	
3627	4822 051 20152	1k5 ± 5%	
3628	4822 111 91532	4k7 ± 5%	
3900	4822 116 90434	1k ± 5%	
3901	4822 116 90434	1k ± 5%	
3902	4822 116 90434	1k ± 5%	conn. block
3903	4822 116 90434	1k ± 5%	conn. block
3904	4822 051 20123	12k ± 5%	
3904	4822 116 90434	1k ± 5%	conn. block
3905	4822 051 20123	12k ± 5%	
3905	4822 116 90434	1k ± 5%	conn. block
3906	4822 051 20123	12k ± 5%	
3907	4822 051 20123	12k ± 5%	
3908	4822 051 20123	12k ± 5%	
3909	4822 051 20123	12k ± 5%	
3910	4822 051 20123	12k ± 5%	
3911	4822 051 20123	12k ± 5%	
3911	4822 111 91517	10k ± 5%	conn. block
3912	4822 051 20123	12k ± 5%	
3912	4822 111 91517	10k ± 5%	conn. block
3913	4822 051 20123	12k ± 5%	
3913	4822 111 91661	47k ± 5%	conn. block
3914	4822 051 20123	12k ± 5%	
3914	4822 111 91522	2k2 ± 5%	conn. block
3915	4822 051 20123	12k ± 5%	
3915	4822 111 91522	2k2 ± 5%	conn. block
3916	4822 051 20123	12k ± 5%	
3916	4822 111 91522	2k2 ± 5%	conn. block
3917	4822 111 91522	2k2 ± 5%	
3918	4822 111 91518	100k ± 5%	
3919	4822 051 20393	39k ± 5%	
3919	4822 111 91522	2k2 ± 5%	conn. block
3920	4822 111 91516	1k ± 5%	
3921	4822 111 91498	15k ± 5%	
3922	4822 051 20393	39k ± 5%	
3923	4822 111 91516	1k ± 5%	
3924	4822 111 91498	15k ± 5%	
3925	4822 111 91532	4k7 ± 5%	
3926	4822 111 91532	4k7 ± 5%	
3927	4822 111 91532	4k7 ± 5%	
3928	4822 111 91532	4k7 ± 5%	
3930	4822 111 91532	4k7 ± 5%	
3933	4822 111 91532	4k7 ± 5%	

3939	4822 111 91532	4k7 ± 5%	
3941	4822 051 20152	1k5 ± 5%	

- Coils -

5104	4822 157 61915	Filter coil
5105	4822 156 11081	Detector coil
5110	4822 157 53338	1mH ± 10%
5111	4822 152 20678	33µH ± 10%
5119	4822 157 53575	3µ3 ± 10%
5120	4822 152 20677	10µH ± 10%
5121	4822 152 20677	10µH ± 10%
5122	4822 152 20678	33µH ± 10%
5123	4822 152 20679	68µH ± 10%
5124	4822 157 53338	1mH ± 10%
5125	4822 152 20683	IFT AM
5126	4822 152 20682	AM Osc. coil
5127	4822 152 20678	33µH ± 10%
5128	4822 157 53906	47µH ± 10%
5130	4822 152 20681	160µH
5131	4822 157 53338	1mH ± 10%
5132	4822 157 60499	330µH ± 10%
5133	4822 157 60499	330µH ± 10%
5601	4822 156 21438	LPF-V10-A
5602	4822 156 21438	LPF-V10-A

- Semiconductors -

6104	4822 130 30621	1N4148
6105	4822 209 73507	TEA6100
6106	4822 209 61954	TSA6057/C5
6108	4822 130 60511	BC847B
6109	4822 130 60511	BC847B
6110	5322 130 31684	BB809
6111	4822 209 72247	TEA6200
6112	4822 209 72892	TEA6310T/V2
6113	4822 209 72894	TDA1516Q/N5
6114	4822 209 72894	TDA1516Q/N5
6115	4822 130 60511	BC847B
6116	4822 130 60511	BC847B
6117	4822 130 60511	BC847B
6118	4822 130 60511	BC847B
6119	4822 209 72227	L4916
6122	4822 209 72227	L4916
6123	4822 130 40995	BD438
6124	4822 130 81624	1.5KE27
6125	5322 130 30684	1N4002
6126	4822 130 30621	1N4148
6127	4822 130 30621	1N4148
6128	4822 209 72252	L4904
6131	4822 130 30621	1N4148
6132	4822 130 30621	1N4148
6133	4822 130 30621	1N4148
6134	4822 130 30621	1N4148
6135	4822 130 30621	1N4148
6136	4822 130 30621	1N4148
6139	4822 130 30621	1N4148
6140	4822 209 71871	TA7784P
6142	4822 130 30621	1N4148
6143	4822 130 34173	BZX79-C5V6
6144	5322 130 34955	BA482
6145	4822 130 60511	BC847B
6146	5322 130 60068	BC558C
6147	5322 130 60068	BC558C
6148	4822 130 44257	BC547
6149	4822 130 44257	BC547
6150	5322 130 60068	BC558C
6151	4822 130 44257	BC547
6152	4822 130 44257	BC547
6153	4822 130 60511	BC847B
6165	5322 130 30684	1N4002
6166	4822 209 62099	TMP47C800N 777-RC2
6168	5322 130 30684	1N4002
6169	4822 209 72042	MC78L05ACP
6170	4822 900 10082	X2404I Programmed
6172	5322 130 30684	1N4002
6287	5322 130 42755	BC847C
6288	4822 130 60511	BC847B
6289	4822 130 60511	BC847B
6290	5322 130 60508	BC857B
6291	5322 130 60508	BC857B
6292	4822 130 30621	1N4148
6293	4822 130 60511	BC847B
6294	4822 130 34173	BZX79-C5V6
6295	4822 130 34174	BZX79-C4V7
6296	4822 130 31983	BAT85
6297	4822 130 30621	1N4148
6601	5322 130 60068	BC558C
6602	5322 130 60068	BC558C
6603	5322 130 31928	BAS16
6604	4822 130 40959	BC547B
6605	5322 130 31928	BAS16
6606	4822 130 40959	BC547B
6607	4822 130 40959	BC547B
6800	4822 130 90794	LC-Display
6801	4822 209 72893	PCF8566T
6900	4822 130 80954	BZV55-C5V6
6901	4822 130 80954	BZV55-C5V6
6902	4822 130 80954	BZV55-C5V6
6903	4822 130 80954	BZV55-C5V6
6904	4822 130 80954	BZV55-C5V6
6905	4822 130 80954	BZV55-C5V6
6910	4822 130 80446	LL4148
6911	4822 130 80446	LL4148
6912	4822 130 80446	LL4148
6913	4822 130 61233	BC857
6914	4822 130 42615	BC817-40
6915	4822 130 42615	BC817-40
6916	4822 130 42615	BC817-40
6917	4822 130 42615	BC817-40

7.1 ALIGNMENT TABLE

For more information see general information "General alignment procedures for car radio"

Alignment	SK					
Quadrature detector [1]	FM	93 MHz, 10 µV △f = 75 kHz	B		5105	3 align for symetrical distortion on sine wave [2]
α–3 dB	FM	93 MHz, 15 µV △f = 22.5 kHz f mod = 1 kHz	B		3113	5 1.6V DC ± 30mV
Stereo separation	FM	93 MHz, 1 mV stereo signal	B			L 1 / R 2 0 dB (775mV)
		93 MHz, 1 mV stereo – R			3601	R 2 – L 1 max. separation
AM-search level [3]	MW	990 kHz,50 µV	A		3111	6 1.5 V DC [4]

[1] Switch off the softmute by connecting a resistor of 15kΩ between pin 1 and pin 2 of IC6105

[2] Switch on the softmute again.

[3] Connect base 6153 to ground.

[4] Disconnect base 6153 from ground.

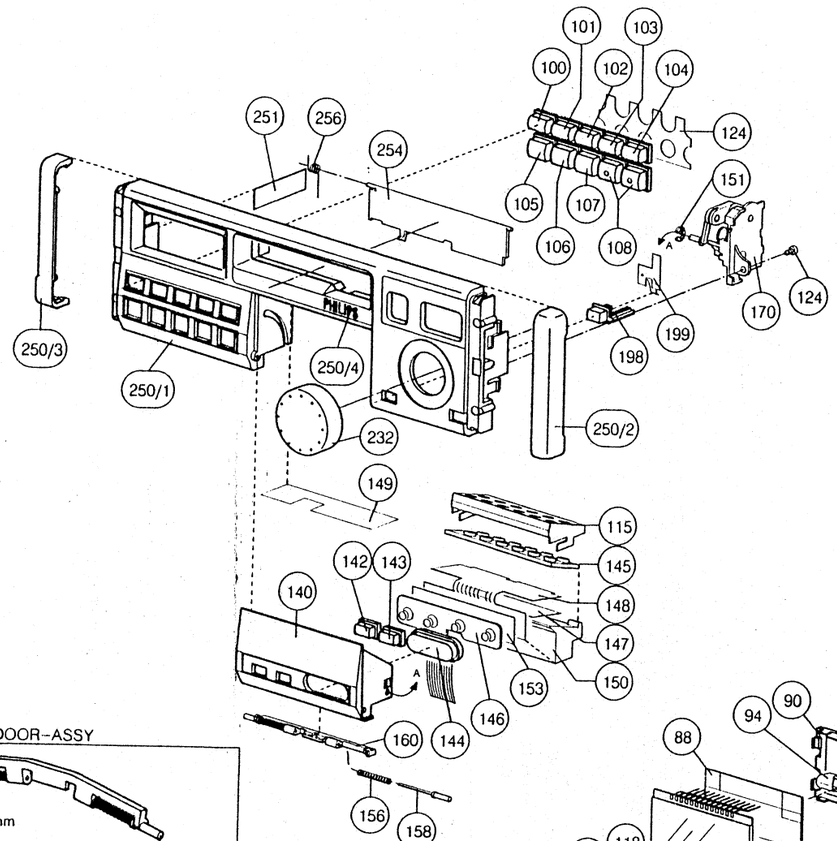
7.2 CHECK TABLE

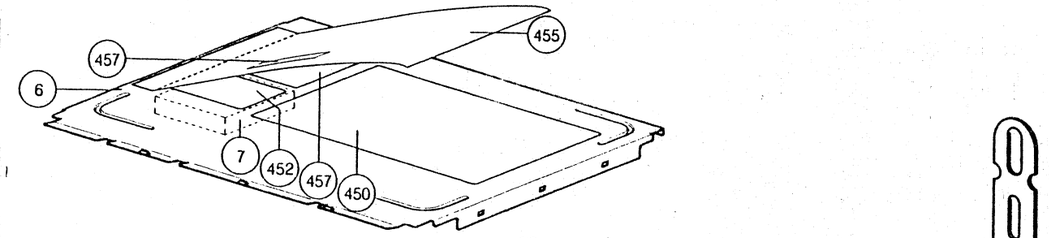
For more information see general information "General alignment procedures for car radio"

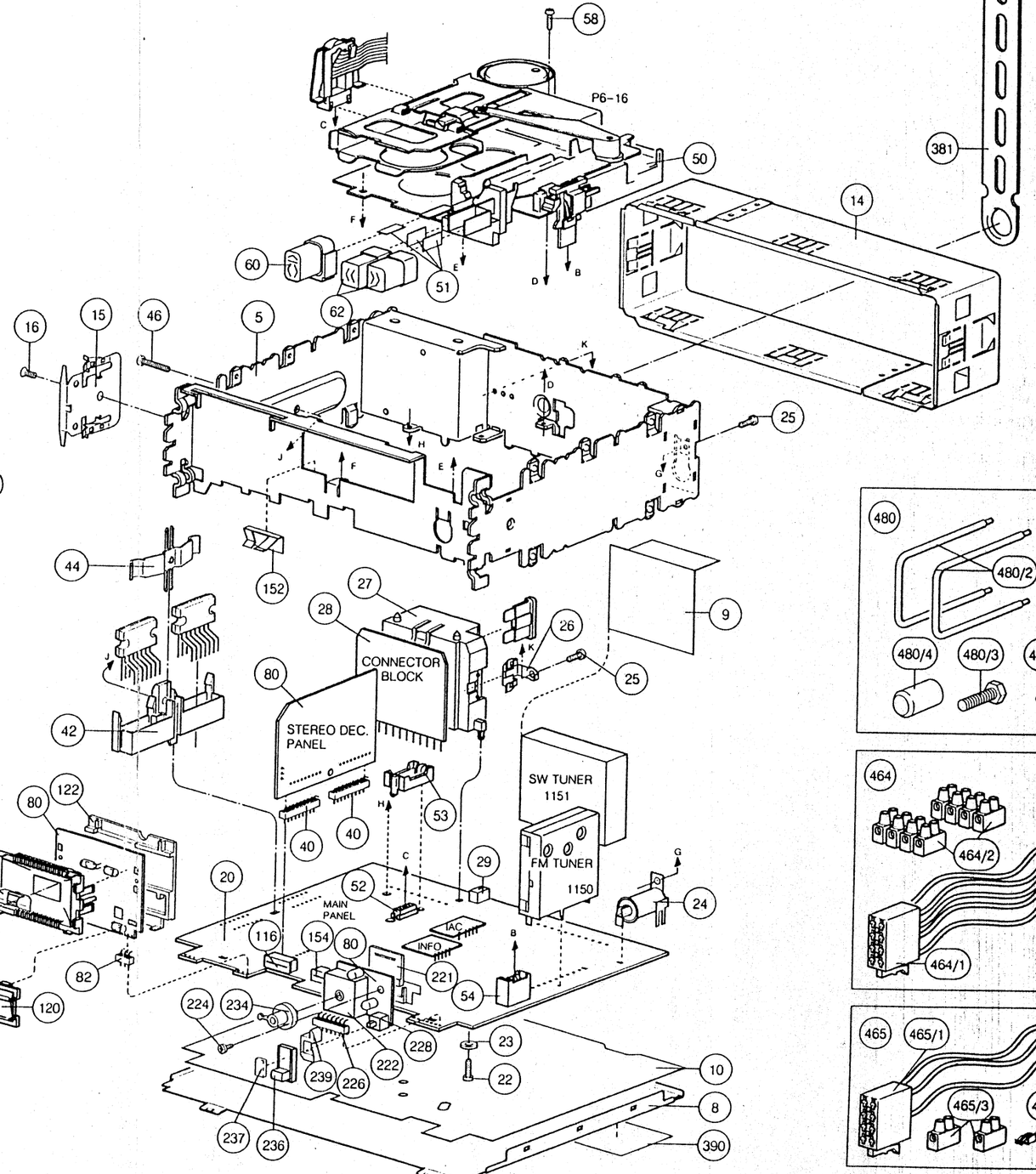
Check	SK				Setting of controls		
Reference oscillator frequencies	FM	–	–	–	–	12 40 kHz ± 1 Hz	
						11 4.0 MHz ± 20 kHz	
						10 32.768 kHz ± 0.5 Hz	
α–3 dB	FM	93 MHz, 1mV △f = 22.5 kHz f mod. = 1 kHz	B			1 0 dB (775 mV)	
		93 MHz, 15 µV △f = 22.5 kHz f mod. = 1 kHz				1 – 3 dB	
FM-Mute	FM	93 MHz, 1 mV	B			1 0 dB (775 mV)	
		no signal				–28 dB≤ 1 ≤–38 dB	
26 dB-SNR	FM	93 MHz, 6 µV △f = 22.5 kHz f mod. = 1 kHz	B			1 0 dB (775 mV)	
		93 MHz, 6 µV without mod.				1 ≥ 26 dB	
	MW	990 kHz, 150 µV 1 kHz, 30% AM	A			1 0 dB (775 mV)	
		990 kHz, 150 µV without mod.				1 ≥ 26 dB	

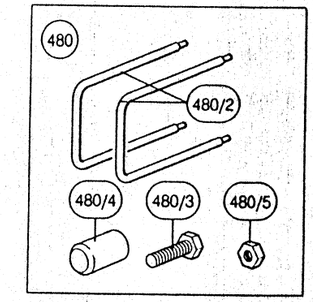
Check	SK				Setting of controls		
26 dB–SNR	LW	198 kHz, 230 µV 1 kHz, 30% AM	A			1 0 dB (775 mV)	
		198 kHz, 230 µV without mod.				1 ≥ 26 dB	
	SW	7100 kHz, 110 µV 1 kHz, 30% AM	A			1 0 dB (775 mV)	
		7100 kHz, 110 µV without mod.				1 ≥ 26 dB	
Demodulated FM-levels	FM	93 MHz, 1 mV △f = 22.5 kHz f mod. = 1 kHz	B			3 200 mV ± 1 dB	
		93 MHz, 1 mV △f = 6.75 kHz f mod. = 19 kHz				3 50 mV ± 1 dB	
		93 kHz, 1 mV △f = 3.75 kHz f mod. = 57 kHz				3 20 mV ± 1 dB	
Demodulated AM-level	MW	990 kHz, 1 mV 1 kHz, 30% AM	A			4 350 mV ± 1 dB	
Cross talk	FM	93 MHz, 1 mV stereo signal	B			L 1 / R 2 0 dB (775 mV)	
		93 MHz, 1 mV stereo-R				R 2 – L 1 ≥ 28 dB	
SDS/10 dB Cross talk	FM	93 MHz, 1 mV stereo signal	B			L 1 / R 2 0 dB (775 mV)	
		93 MHz, 150 µV stereo-R				R 2 – L 1 = 10 dB	
Search level FM	FM	93 MHz, 30 µV	B			6 2.0 V-DC	
Search level AM	MW	990 kHz, 70 µV	A			6 1.5 V-DC	
	SW	4750 kHz, 30 µV				6 ≥2.0 V-DC	
VC-FM	FM	–	–	87.5 MHz		7 ≥ 1.0 V-DC	
				108 MHz		7 ≤ 6.0 V-DC	
VC-AM	LW	–	–	144 kHz		8 ≥ 0.8 V-DC	
	MW			1629 kHz		8 ≤ 5.0 V-DC	
	SW	–	–	9500 kHz		14 ≥ 2.0 V-DC	
				17900 kHz		14 ≤ 8.0 V-DC	
I.A.C.	FM	Vp, τ, T τ = 10 µsec T = 300 µsec Vp = 60 mV	C				9 25-50 µs
SDK-sensitivity	FM + INFO	93 MHz, 60 µV △f = 22.5 kHz f mod. = 1 kHz + SK + BK + DK	B		min.	**INFO SK** in display + DK signal 1	

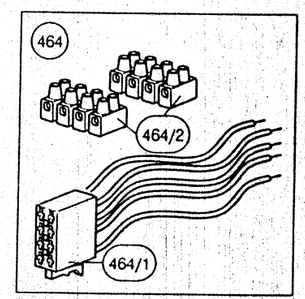
8. EXPLODED VIEW

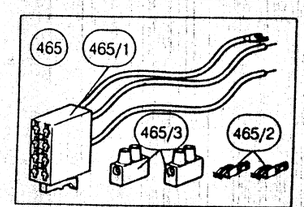




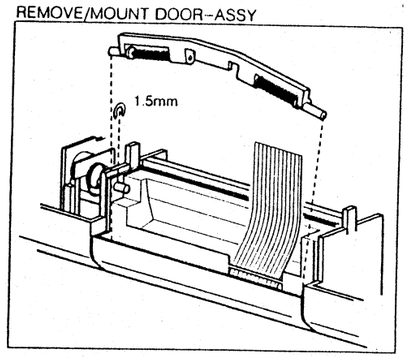








REMOVE/MOUNT DOOR-ASSY

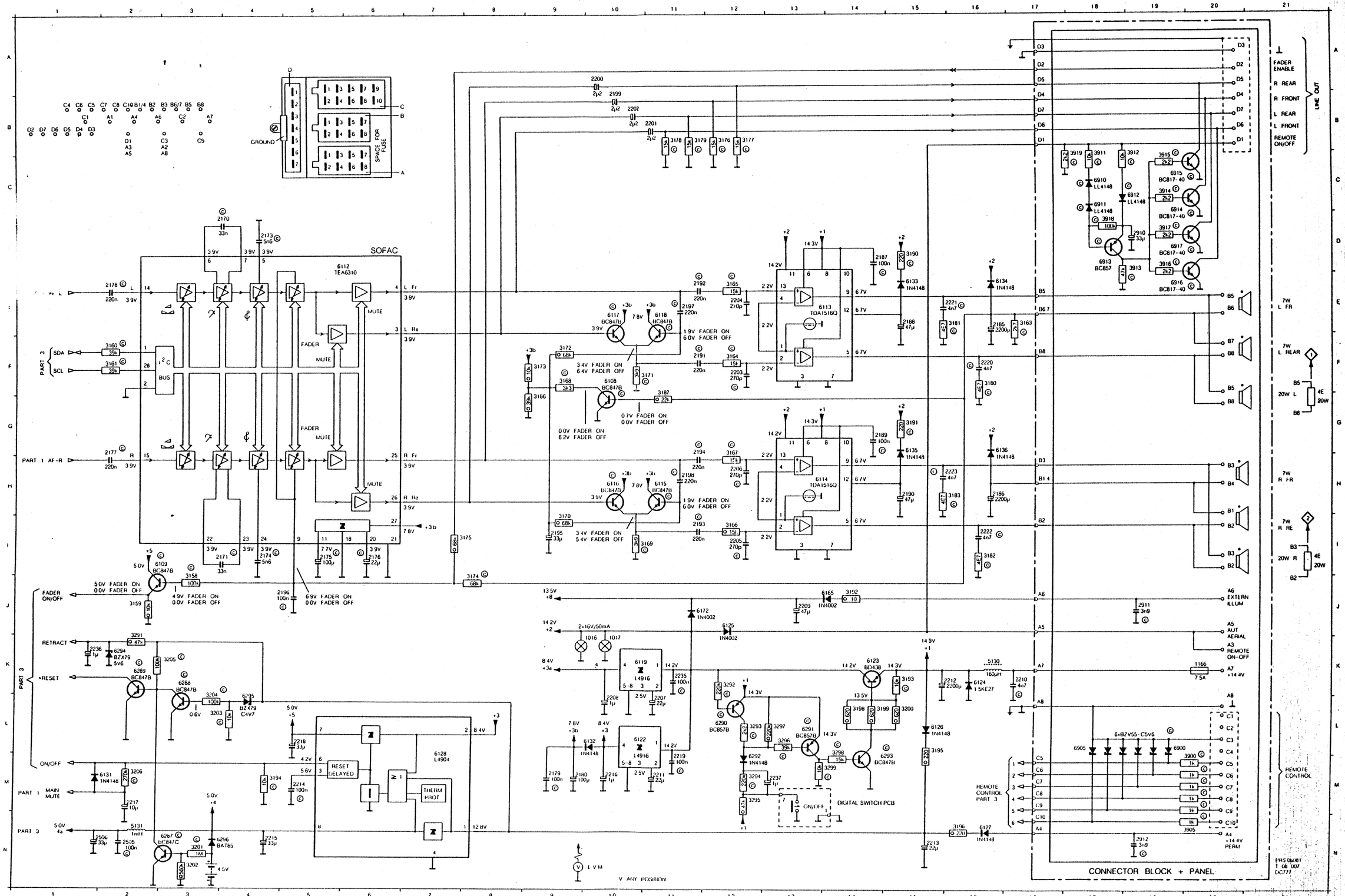


EVA 01016
T28/950

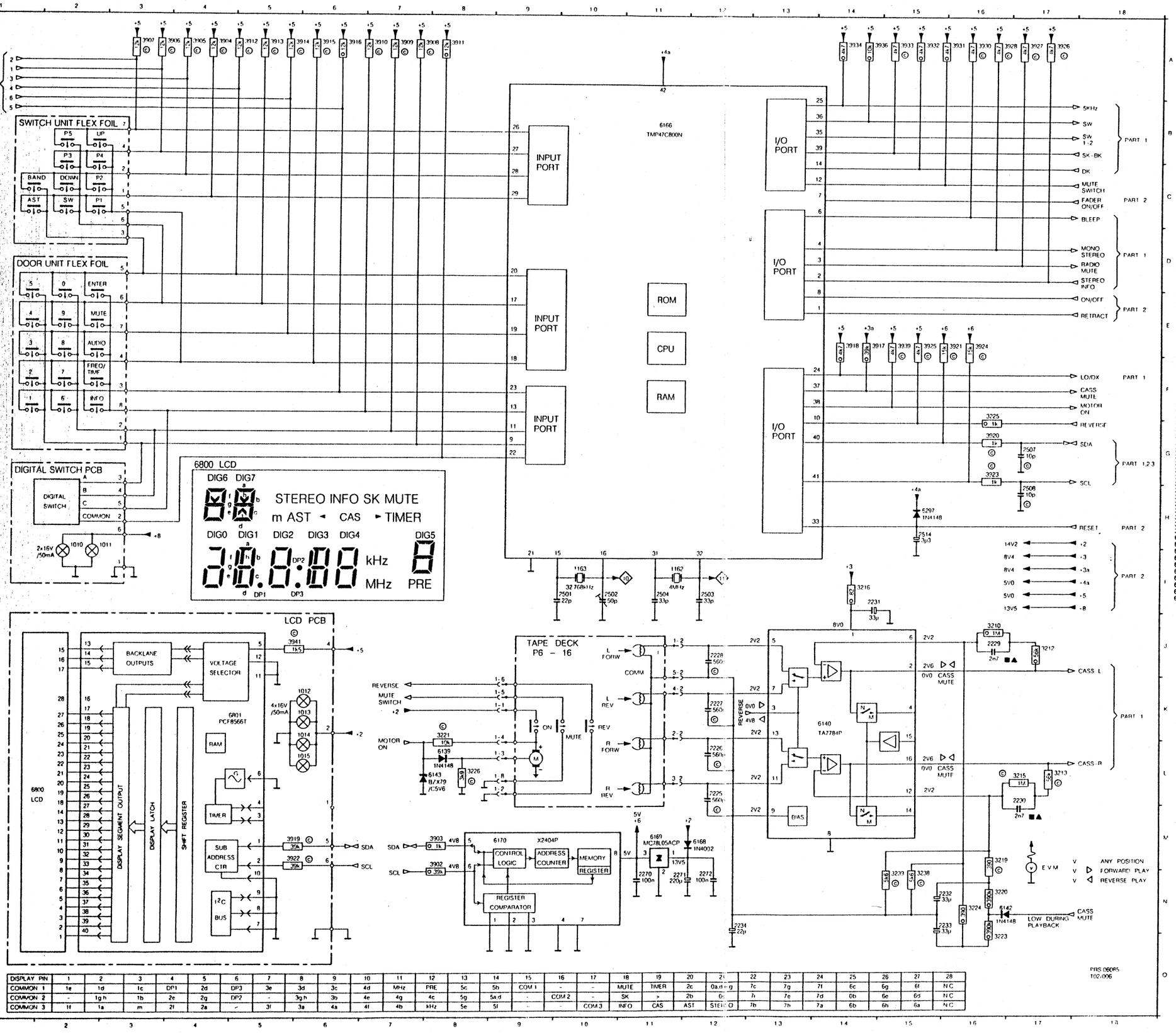
90DC777

6.2 PART 2: AF AND POWER SUPPLY

1016 K9 1017 K10 1166 K20 2170 D3 2171 I3 2173 D4 2174 I4 2175 I5 2176 I6 2177 G2 2178 E2 2179 M9 2180 M9 2185 E16 2186 H16 2187 D14 2188 E15 2189 G14 2190 H15 2191 F11 2192 E11 2193 L11 2194 G11 2195 I9 2196 J4 2197 E11 2198 H11 2199 B10 2200 A10 2201 B11 2202 B10 2203 F12 2204 E12 2205 I12 2206 H12 2207 L11 2208 L10 2209 J13 2210 K17 2211 M11 2212 K15 2213 N15 2214 M5 2215 N4 2216 M10 2217 M2 2218 L5 2219 M11 2220 F16 2221 E15 2222 I16 2223 H15 2235 K11 2236 K1 2237 M13 2505 N2 2506 N1 2910 D19 2911 J19 2912 N19 3158 J3 3159 J2 3160 F2 3161 E17 3163 E17 3164 F12 3165 E12 3166 F12 3167 G12 3168 F9 3169 I10 3170 I9 3171 F10 3172 F9 3173 F9 3174 J8 3175 I7 3176 B12 3177 B12 3178 B11 3179 B11 3180 F16 3181 E16 3182 L16 3183 K15 3193 N3 3194 M4 3195 L15 3196 N16 3198 L14 3199 L14 3200 L15 3201 N3 3202 K12 3203 K2 3204 L3 3205 K3 3206 M2 3291 K2 3292 K12 3293 L12 3294 M12 3295 M12 3296 L13 3297 L13 3298 L14 3299 M14 3900 M20 3905 N20 3911 C18 3913 C19 3914 C19 3915 C19 3916 D19 3917 D19 3918 D18 3919 C18 5130 K16 5131 N2 6108 F10 6109 I2 6112 D5 6113 E13 6115 H11 6116 H10 6117 E10 6118 E11 6119 K10 6122 L10 6123 K14 6124 K16 6125 J12 6126 L15 6127 N16 6128 M7 6131 M2 6132 L10 6133 E15 6134 E16 6135 G15 6136 G16 6165 J14 6172 J11 6287 N3 6288 K3 6289 K2 6290 L4 6291 L4 6292 M12 6293 M15 6294 K2 6295 L4 6296 N3 6900 L19 6905 L18 6910 C18 6911 C18 6912 C19 6913 D18 6914 C19 6915 C19 6916 E19 6917 D19



6.3 PART 3: µC, EEPROM AND PRE-AMP.



DISPLAY PIN	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
COMMON 1	1e	1d	1c	DP1	2d	DP3	3e	3d	3c	4d	MHz	PRE	5c	5b	COM 1	-	-	-	MUTE	TIMER	2c	0a,d,e,g	7c	7g	7f	6c	6g	6f	N.C
COMMON 2	-	1g,h	1b	2e	2g	DP2	-	3g,h	3b	4e	4g	4c	5g	5a,d	-	COM 2	-	-	SK	>	2b	0c	7h	7e	7d	0b	6e	6d	N.C
COMMON 3	1f	1a	m	2f	2a	-	3f	3a	4a	4f	4b	kHz	5e	5f	-	-	COM 3	INFO	CAS	AST	STEREO	7b	7h	7a	6b	6h	6a	N.C